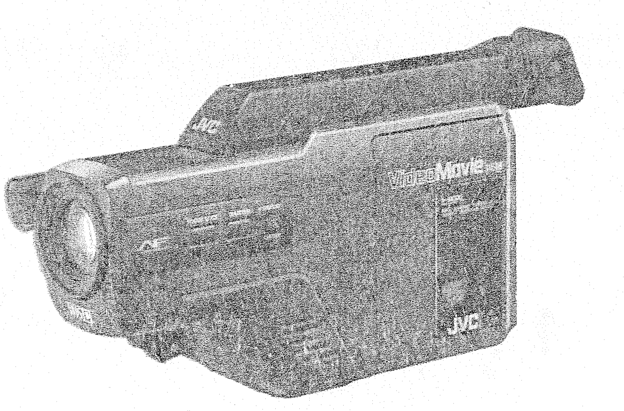
JVC

SERVICE MANUAL

VHS VIDEO MOVIE

GR-A30EG/EK



SPECIFICATIONS

Format : VHS standard
Power source : DC 9.6 V ⎓
Power consumption : 8.8 W
Signal system : PAL-type
Recording system : Luminance: FM recording
Colour: Converted sub-carrier direct recording
Conforms to VHS standard
Cassette : VHS-C cassette
Tape speed : 23.39 mm/sec
Recording time
Max. : 30 minutes (with EC-30 cassette)

VIDEO
Output : 1 Vp-p, 75 ohms, unbalanced (via AV OUT connector)
S/N ratio : More than 43 dB (with Rohde & Schwarz noise meter)

AUDIO
Output : -6 dBs, 1 k-ohm (via AV OUT connector)
Microphone input : -68 dBs, high impedance, unbalanced
Pickup : 1/2″-format CCD
Minimum required illumination : 10 lux (at F/1.4)
Illumination range : 10 – 100,000 lux
Lens : F/1.4 ~ 2.0, f = 8.5 – 51 mm. 6:1 power zoom lens with auto iris control and macro position, filter diameter 46 mm
Viewfinder : Electronic viewfinder with 0.6″ black/white CRT
Selectable high-speed shutter : 1/1000 sec.
White balance adjustment : Full-auto
Operating temperature : 0°C to +40°C
Operating humidity : 35 % to 80 %
Storage temperature : -20°C to +50°C
Weight : 1.1 kg (with viewfinder)
Dimensions : 105(W) x 142(H) x 271(D) mm (incl. viewfinder)

AA-V5EG SPECIFICATIONS
Power requirement : AC 110 – 240 V∿, 50/60 Hz
Power consumption : 21 watts
Output : DC 14 V ⎓ 1.1 A (Charge)
DC 9.6 V ⎓ 1.2A (VideoMovie)
Charging system : Constant current, peak detection, timer controlled
Dimensions : 68(W) x 38(H) x 150(D) mm
Weight : Approx. 380 g

C-P5U SPECIFICATIONS
Type : VHS cassette adapter
Dimensions : 188(W) x 25(H) x 104(D) mm
Weight : 240 g
Accessory : "R6"-size battery x 1

Provided accessories:
AC power adapter/battery charger AA-V5EG
Cassette adapter C-P5U
Battery pack BN-V6GU
Shoulder strap
Lens cap
Battery for clock operation

Designa and specifications subject to change without notice.

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No. 86038
December 1988

NOTE: For a technical description, please refer to Technical Guide VTG86011 GR-A30 PAL.

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INSTRUCTIONS

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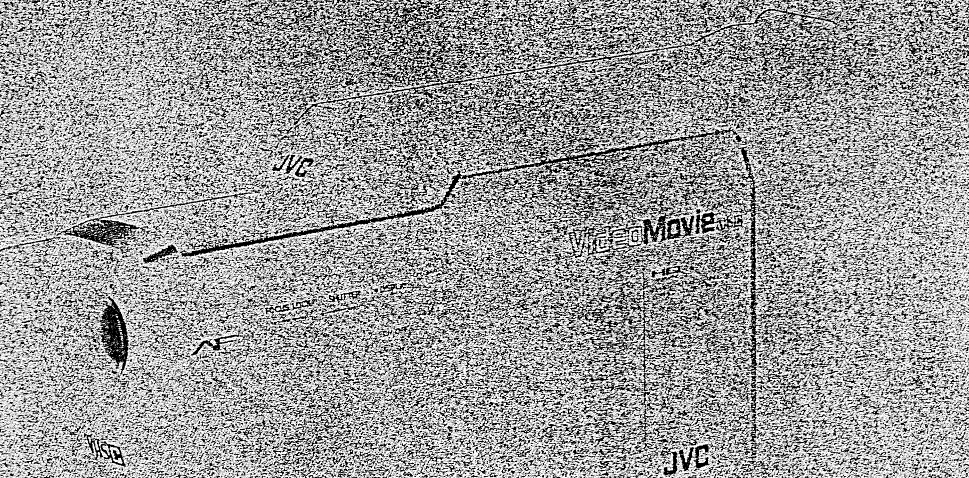
VideoMovie

VHS C
PAL
HQ
High Quality

CAMERA-RECORDER/PLAYER

Specifically for the GR-A30E/AA-V5EG

GR-A30



CCD
Charge Coupled Device

AF
FULL RANGE AF

JVC

CAMERA ENREGISTREUR/LECTEUR GR-A30E
Special pour le GR-A30E/AA-V5EG

KAMERA-REKORDER GR-A30E
Für Modellausführung GR-A30E/AA-V5EG

CAMERA/GRABADORA GR-A30E
Especialmenta para la GR-A30E/AA-V5EG

KAMERA/RECORDER GR-A30E
Speciaal voor de GR-A30E/AA-V5EG

KAMERA/BANDSPELARE GR-A30E
Speciellt avsedd för GR-A30E/AA-V5EG

YU30052-41

SAFETY PRECAUTIONS

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This equipment should be used with DC 9.6 V ⎓ only.

CAUTION

To prevent electric shocks and fire hazards, do NOT use any other power source.

The AA-V6EG AC Power Adapter/Battery Charger should be used with 110 – 240 V∿, 50/60 Hz only.

Caution:

To prevent electric shocks and fire hazards, do NOT use any other power source.

IMPORTANT (In the United Kingdom) Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with following code:

Blue to N (Neutral) or Black
Brown to L (Live) or Red

If these colours do not correspond with the terminal identifications of your plug, connect as follows:

Blue wire to terminal coded N (Neutral) or coloured Black.

Brown wire to terminal coded L (Live) or coloured Red.

If in doubt – consult a competent electrician.

Note

We recommended that you should disconnect the AC cord from the outlet.

Warning on lithium battery

The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate.

Replace battery with Matsushita Electric, CR 2025; use of another battery may present a risk of fire or explosion.

- **Dispose of used battery prompty.**
- **Keep away from children.**
- **Do not disassemble and do not dispose of in fire.**

CAUTION:

To prevent shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified personnel.

NOTES:

- **The rating plate (serial number plate) and safety caution of the main unit are on its bottom.**
- **The rating plate (serial number plate) of the AC power adapter/battery charger is on its bottom.**

This equipment has been produced to comply with Directive number 82/499/EEC.

VHS-C PAL HQ High Quality

- VideoMovie is designed exclusively for the VHS-C video cassette. Only cassettes marked VHS-C can be used with this unit.
- HQ VHS is compatible with existing VHS equipment.

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PRECAUTIONS

For safety, strictly observe the following instructions.
- Do not disassemble or modify the unit.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not use the unit when there is lightning in the vicinity. Disconnect the power cable of connected equipment.

Avoid using the unit under the following conditions:
- Places subject to excessive humidity or dust.
- Near appliances generating strong magnetic or electric fields (speakers, broadcasting antennas, etc.).
- Places subject to soot or steam such as near a cooking stove.
- Places subject to excessive shock or vibration.
- Near a television set (rolling pictures or howling might result).
- Extremely hot places.

Do not expose the unit to high temperatures over 40°C for long periods.

If the unit should be subjected to direct sunlight, or left in a closed car in summer, or placed near a heater, the CCD and the auto-focus sensor may deteriorate and the cabinet may become deformed. Furthermore, this also may cause the transistors and other electronic and mechanical parts to malfunction. Remember the following:
- Do not leave the unit in places of over 50°C.
- Do not use the unit in places of over 40°C.
- Do not use the unit in places of below 0°C.
- Protect the unit from excessively dry or excessively humid conditions (below 35% or above 80% humidity).
- For long storage, select a place between -10°C and 30°C.

Take special care for protection of the unit.
- Do not allow the unit to become wet.
- Do not leave the unit in closed cars on hot summer days.
- Take special care not to drop the unit or strike it against hard objects. Protect from shocks during transportation.

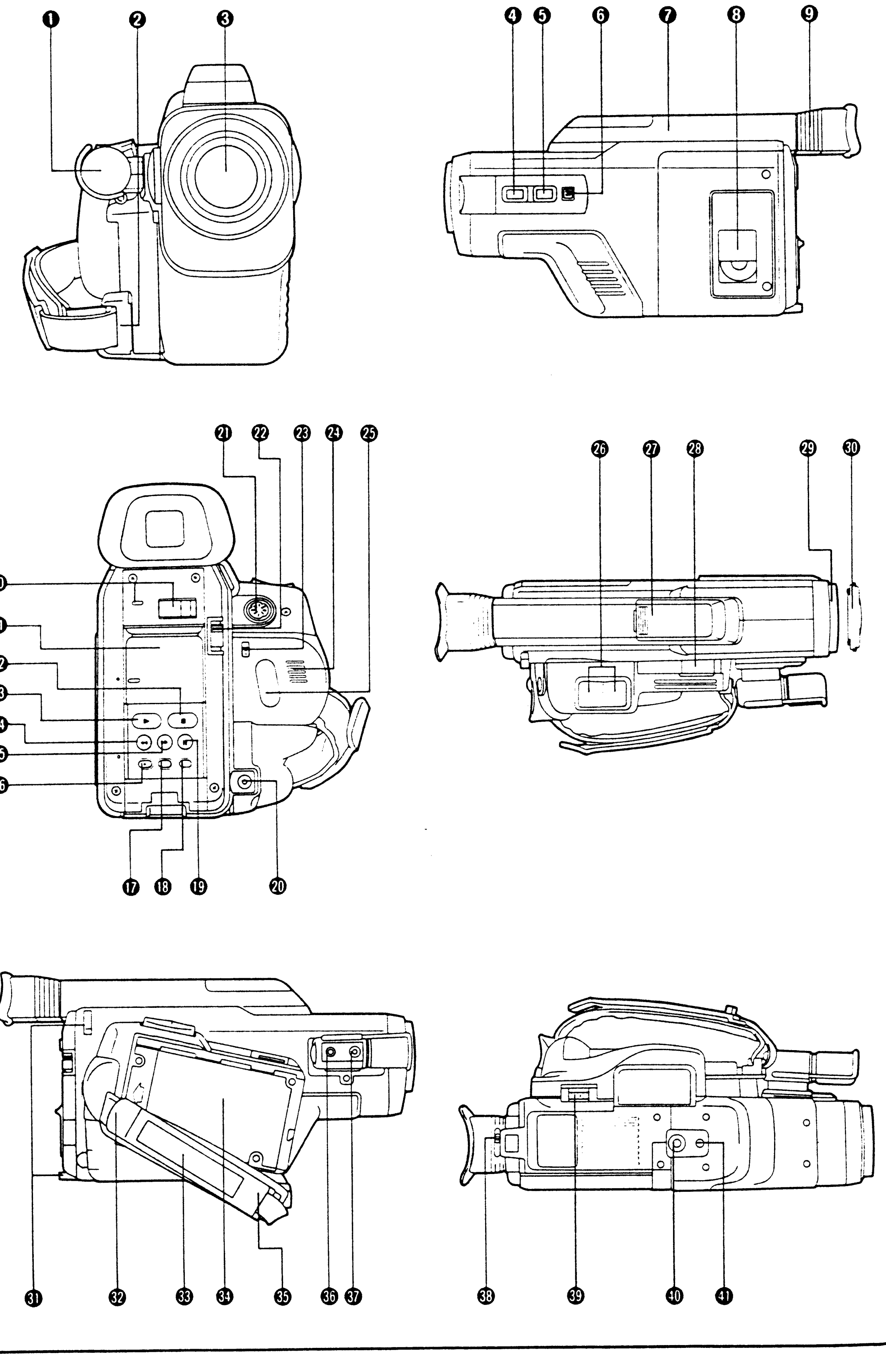
Make it a rule to observe the following instructions.
- Do not remove the battery pack or disconnect other power supply units during recording or playback before pressing the POWER switch to OFF. If not observed, this will cause tape damage.
- When the unit is not in use, remove the battery pack.

Keep the lens and viewfinder eyepiece always clean.
- When the lens is dirty or dusty, blow it off first and then gently wipe with a soft brush or lens cleaning paper.
- The lens is likely to become moldy if left dirty.

Be careful not to damage the CCD.
- Do not keep the lens directed at extremely bright objects such as the sun or other light sources for long periods. Although the CCD is less susceptible to such burn than a tube would be, caution should be exercised when using this unit. Most importantly, the lens should be capped except while actually shooting.
- Do not direct the eyepiece of the viewfinder at the sun.

Auto-focus requires a bit of consideration.
- When a filter or a special-effect lens is to be attached to the end of the lens, be sure to turn power off.

Handle the unit carefully.
- Protect the microphone from excessive shocks.
- Do not carry the unit by holding it only by the viewfinder.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VIDEO CASSETTES

Moisture condensation prevents use of the unit.

- You have observed that pouring a cold liquid into a glass will cause drops of water to form on the glass's outer surface. This same phenomenon occurs on the head drum of a video recorder when the recorder is moved from a cool place to a warm place, after heating in a cold room, under extremely humid conditions or in a place directly subjected to the cool air from an air conditioner.
- Moisture on the head drum can cause severe damage to the video tape, and can lead to internal damage to the recorder itself.
- If moisture condensation occurs on the head drum, a condensation warning appears in the viewfinder and the unit enters the Stop mode, unable to function. In such a case, wait for a few hours until the indicator disappears.

Maintenance

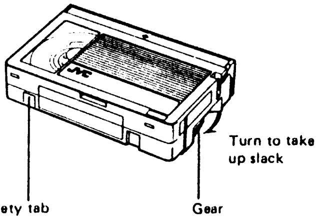
- When the cabinet is dusty, clean by gently wiping with a soft cloth.
- Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the cabinet.
- Cleaning should be done only after the battery pack has been removed or other power units have been disconnected.

Serious malfunctioning

If malfunctioning occurs, stop using the unit immediately and consult your local JVC dealer.

The GR-A30E is designed to be used with PAL-type colour television signals. It cannot be used for playback with a television of a different standard. However, live recording and viewfinder playback are possible anywhere. Use the BN-V5GU/BN-V6GU/BN-V7GU battery packs and, to recharge them, the provided multivoltage AC power adapter/battery charger. (An appropriate conversion adapter may be necessary to accommodate different designs of AC outlets in different countries.)

- Recording onto prerecorded tapes automatically erases the previously recorded video and audio signals.
- An inverted cassette cannot be inserted.
- Do not load and unload the cassette repeatedly without allowing the tape to run at all. This will slacken the tape and thereby damage it.
- Make certain before loading the cassette that the tape is not slack. If there is any slack, turn the gear on the cassette in the direction of the arrow to take up slack.
- The cassette is equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording is impossible. If you wish to record on a cassette whose tab has been removed, use adhesive tape to reseal the slot.
- To avoid excessive exposure to dust and fingerprints, do not open the front tape cover.



Storage of cassettes

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid storing the cassettes in humid or dusty places.
- Do not drop the cassettes. do not expose them to violent vibrations or shocks.
- Do not expose the cassettes to strong magnetic fields (near a motor, transformer or magnet).
- Place the cassettes in cassette cases and position them vertically.

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FEATURES

- Allows direct playback with no additional components necessary.
- Ultra-compact and ultra-lightweight: a mere 1.1 kg.
- New Auto-focus system offering precise focusing from macro range to infinity.
- Flying erase head for noise-free, smooth scene transitions.
- Newly developed high-resolution 1/2" field-storage type CCD (Charge Coupled Device) pickup delivering 400-line horizontal resolution pictures in camera section.
- Full-auto operation of focus, exposure, and white balance.
- Powerful, 6:1 power zoom.
- HQ (High Quality) System for superlative picture quality.
- High-sensitivity/low-lag design: allows shooting in light as low as 10 lux.
- High-speed, 1/1000-second electronic shutter for sharp, clear playback of fast-action shots.
- Automatic Colour Tracking white balance.
- Ultra-compact electronic viewfinder (monochrome CRT, 0.6-inch screen) with diopter control, also for instant on-the-spot playback.
- Selectable automatic date recording function.
- Recordable date/time/age display.
- Remaining tape time indicator.
- Trigger alarm system for preventing recording errors.
- Shuttle Search in both directions.
- Unique grip battery doubles as palm grip, saving weight and space.
- Ergonomic design with palm grip and finger rest for trigger control.
- Three-way power supply flexibility: battery pack, AC power adapter, and car battery.

POWER SUPPLY SYSTEM

The convenient 8-way power supply system gives you a choice of the most appropriate power supply unit, depending on the application.

CAUTION
- No function is available without power supply.
- Do not use any power supply other than specified.
- Never attempt to use these power supply units with any equipment other than the VideoMovie.

Where AC power is not available

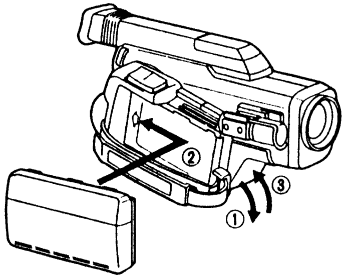
Use the battery packs:
- BN-V5GU (Regular)
- BN-V6GU (High-capacity)
- BN-V7GU (Super-high-capacity)

Note:
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, be sure to charge it. See page 20.

Attaching the Battery Pack

① Pull down the battery pack release lever.
② Align the battery pack over the outline in the battery pack mount, and slide the battery pack into place in the direction of the arrow.
③ Push up on the battery pack release lever, until it locks into place.

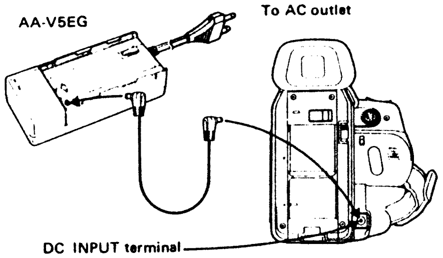
To remove the battery pack, pull down the battery pack release lever and slide out the battery.



With AC power

Use the provided AA-V5EG AC power adapter/battery charger.

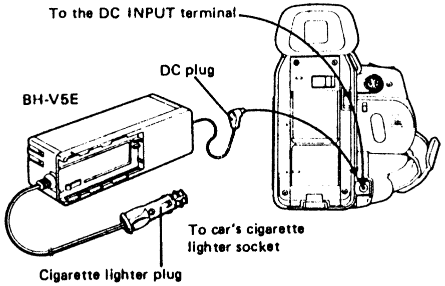
Note: This unit can be used with 110 V and 240 V power supplies. Selection is automatic and no adjustment is required.

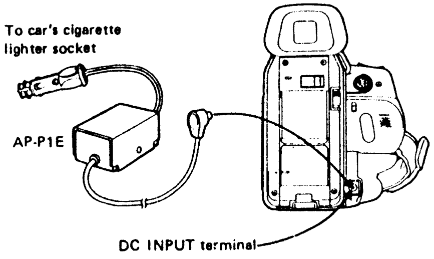


In a car

Use the optional AP-P1E car battery cord or BH-V5E car battery charger.

- Leave the car's engine idling when using the car battery. (For use with 12 V negative-grounded cars only.)

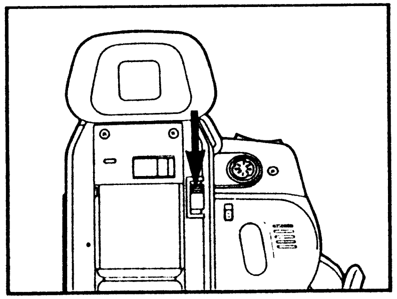




BEFORE SHOOTING

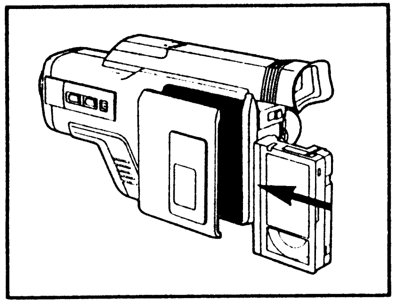
Loading a Video Cassette

1



Open the cassette holder by pressing the EJECT botton.

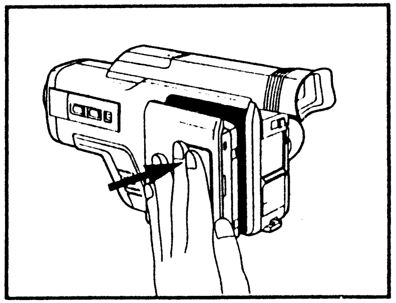
2



Insert the cassette with its printed arrow facing outward.

Ensure that tape is not slack inside the cassette, then load the cassette correctly. See page 3.

3



Close the cassette holder by pushing its center area. The tape will be automatically loaded for recording standby.

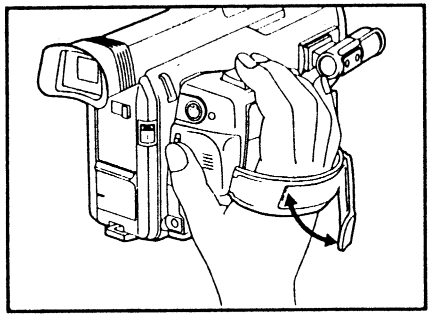
Unloading a Video Cassette

1. Press the EJECT button.
   The cassette holder will open.
2. Remove the cassette.
3. Close the cassette holder by pushing its center area.

Note:
- The cassette can be ejected even when the power is off.
  The holder may not open if the battery is completely discharged.

Notes:
- Loading a cassette is possible while the power is either on or off. However, to save battery power, it is recommended that you load a cassette while the power is off. If you press the EJECT switch with the power off, the power turns on for tape loading and then off automatically. Later, when you actually begin shooting, you only have to slide the POWER switch and then the start/stop button.
- Do not repeat loading and unloading of the cassette without running the tape, as this will slacken the tape, causing tape damage.

Adjusting the Grip Strap



1 Separate the Velcro strip to expand the loop.

2 Pass your right hand through the loop and grasp the lens grip. Adjust the length of the strap to suit your hand size and refasten the Velcro strip.

CONTROLS AND CONNECTORS

Refer to the diagrams on the front foldout page.

① Exclusive microphone
Omnidirectional condenser microphone for simultaneous sound recording.

② Battery pack release lever
Pull down to release the battery pack.

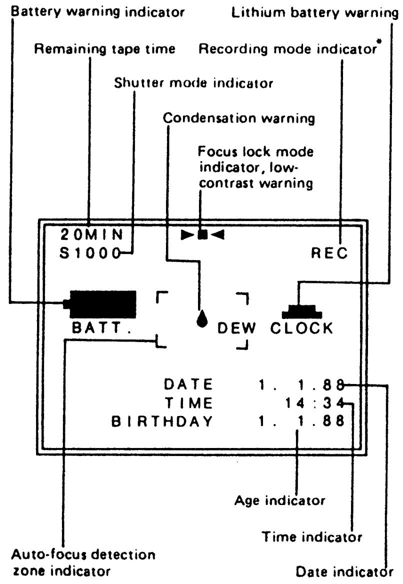
③ 6:1 zoom lens
F/1.4, f = 8.5 – 51 mm. Filter diameter: 46 mm.

④ FOCUS LOCK button
Pressing this button cancels the Auto-focus mode and fixes the focus.

⑤ SHUTTER mode button
Pressing this button switches the shutter between its 1/1000 second ("S1000") speed and 1/50 second speed.

⑥ DISPLAY ON/OFF button
Press this button when you do not wish to record the date/time/age. This will remove date/time/age indications from the viewfinder. Press again to record date/time/age. Date/time/age will reappear in the viewfinder.

⑦ Electronic viewfinder
For monitoring scene being shot or the playback picture after recording. Several indicators are included, as well as the date/time/age or high-speed shutter if selected.



* "CASSETTE" appears if not cassette is loaded, or if cassette with safety tab removed is loaded.

⑧ Cassette holder
Insert a VHS-C video cassette for recording or playback.

⑨ Eyepiece
To clean, turn the eyepiece counterclockwise and pull to remove.

⑩ POWER switch
Slide to turn the power on. The indicator will light. Slide again to switch off power.

⑪ Control panel cover
Slide this cover to the "CAMERA" position while shooting.

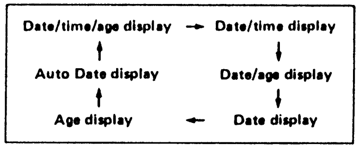
⑫ STOP button
Press to engage the Stop mode.

⑬ PLAY button
Press to start playback.

⑭ REW button
Pressing this button in the Stop mode rewinds the tape; pressing it in the Play mode allows fast playback in reverse.

⑮ FF button
Pressing this button in the Stop mode fast-forwards the tape; pressing it in the Play mode allows fast playback.

⑯ DISPLAY MODE button
Press this button to select the date/time/age display and recording mode. It cycles through the modes in the following order:



The auto-date-record function automatically displays and records the date for 5 seconds upon turning on the power and beginning recording. Before recording begins, this mode is indicated in the viewfinder by auto date record reserve indication "AUTO DATE".

⑰ DISPLAY SELECT button
Use to select the portion of the clock or date settings to be changed. Cycles through the day, month, year, hour, minute and age settings. To end adjustment, press once after selecting the birth date portion.

⑱ DISPLAY SET button
Use to set the built-in clock and date function.

⑲ PAUSE button
Press to view a still picture during playback or pause playback. This button can also activate the rehearsal function. See page 10.

⑳ DC input terminal
For connection of the provided AA-V5EG AC power adapter/battery charger, optional BH-V5E car battery charger or AP-P1E car battery cord for DC power supply.

㉑ AV OUT connector
Both audio and video signals may be delivered from this connector. To dub from this unit, connect the A/V input connectors of a second recorder to this connector, using the optional VC-V8961SE A/V output cable. To play back from this unit to a TV set, make a connection between this connector and the TV's A/V input terminals using the A/V output cable.
For playback with a TV set not equipped with A/V terminals, connect the RF-V3E RF unit (optional) to this connector and to the TV.

㉒ EJECT switch
To open the cassette holder.

㉓ ALARM ON/OFF switch
Switch to ON to engage the trigger alarm system. switch to OFF when you do not wish to use this system. When the ALARM ON/OFF switch is set to ON, an electronic alarm beeps when the Recording start/stop button is pressed to begin recording. The electronic alarm beeps twice when the Recording start/stop button is pressed for record pause. This alarm helps prevent recording errors.

㉔ Thumb rest
Place your thumb on this grooved area next to the start/stop switch between switch operations.

㉕ Recording start/stop button (Trigger button)
Press this button in the Recording Standby mode to start recording. Pressing it again re-engages the Recording Standby mode.

㉖ Power zoom buttons
For automatic zooming; press "T" for telephoto and "W" for wide-angle.

㉗ Accessory Shoe cover
Remove this cover to attach an optional carrying handle or optional microphone.

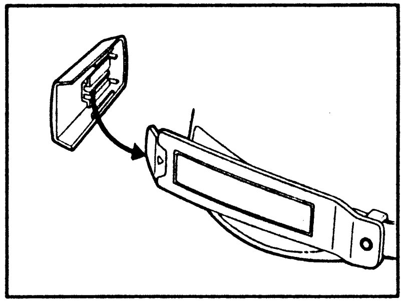
㉘ CLOCK BATTERY compartment
Holds the lithium battery that powers the date/time/age display.

㉙ Lens hood
Attach the lens cap to the lens hood when not in use.

㉚ Lens cap

㉛ Slots for shoulder strap

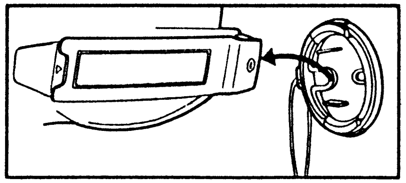
㉜ Shoe cover hook
Keep the shoe cover here while using the accessory shoe.



㉝ Grip strap
Secures the operator's hand to the hand grip. Adjusts to fit hand size.

㉞ Battery pack mount

㉟ Lens cap hook
This keeps the lens cap from swinging during shooting.



㊱ Earphone jack (PHONE)

㊲ External microphone jack (MIC)

㊳ Dioptric adjustment control
Adjusts the viewfinder lens to suit the operator's eyesight.

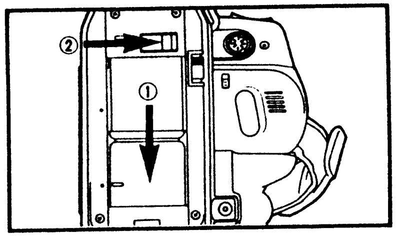
㊴ TRACKING control
Minimizes noise bars, if observed, during playback.

㊵ Tripod mounting socket

㊶ Stud hole

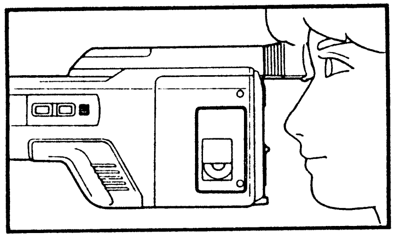
RECORDING OPERATION

1



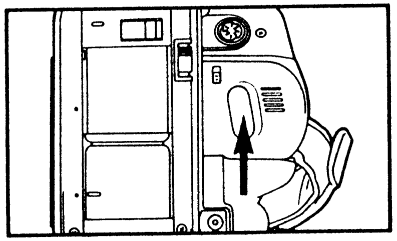
①Set the control panel cover to "CAMERA".
②Slidé the POWER switch to ON.

2



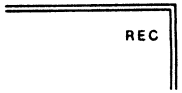
Determine the composition by referring to the viewfinder image. For zooming, see page 13.
For date/time/age recording, see page 14.
For high-speed electronic shutter, see page 13.

3

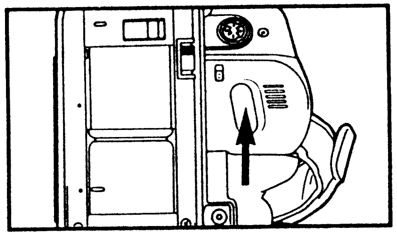


Press the start/stop button.

- This causes REC to appear on the viewfinder screen, showing that recording is actually taking place.

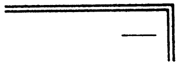


4

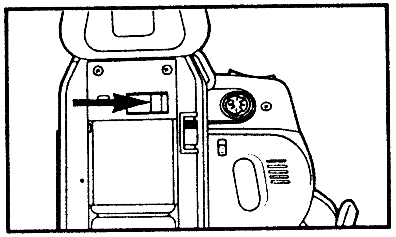


To stop recording temporarily, press the start/stop button once again.

- This causes – to appear on the viewfinder screen, showing that recording is paused.



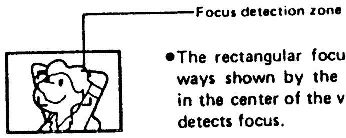
5



When you're finished shooting, slide the POWER switch to turn the power off.

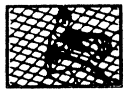
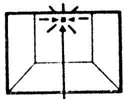
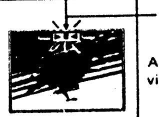
- To start recording again, slide the POWER switch on. The recording lock function ensures a smooth transition.
- If the Recording Standby mode continues for longer than about 5 minutes, the unit switches itself off automatically for tape protection. To restart recording, turn the power on.
- Repeating steps 3 and 5 produces assemble recordings.
- If recording is restarted from the Stop mode, a few frames of the previously recorded picture is replaced with a new recording. To avoid this, follow the technique described in "Assemble Recording Technique-2" on page 12.
- For worry-free shooting, it is recommended that you prepare battery packs for 3 or 4 times the length of time required for the intended recording.

Precautions for auto-focus



- The rectangular focus area, always shown by the indicators in the center of the viewfinder, detects focus.

Correct focus may not be obtained in the following situations. In such cases the focus lock should be engaged to obtain proper focus. (See page 13).

	Two subjects at different distances overlap in the same scene.
	The subject has no contrast (differences in brightness and darkness), such as a flat, one colour wall, or a clear, blue sky, for instance.
	Low-contrast warning A dark object is barely visible in the viewfinder.

Note:

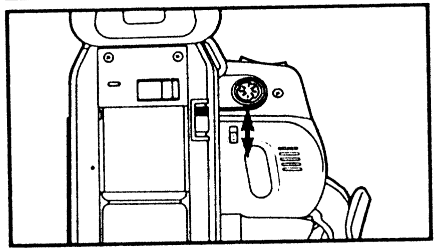
- If the lens is smeared with stains or blurred with condensation, accurate focusing is not possible. Keep it clean. If it becomes dirty, wipe with a piece of soft cloth. When condensation occurs, dry it by wiping with a soft cloth or wait for conditions in which they become dry.

Macro shot

The new auto-focus system can offer continuous shooting ability from close-up to infinity. With wide angle, the subject can be right up to the front of the lens.

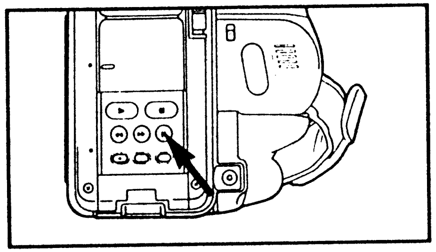
- Perform macro shooting in the Zoom-out mode. When operating in the Zoom mode, zoom automatically shifts to wide angle with the Focus Lock mode indicator blinking, and then focus adjustment is made. This process requires a few seconds.
- For best results, increase illumination when shooting in the Macro mode.

Trigger alarm system



When the ALARM ON/OFF switch is set to on, an electronic alarm beeps when the Recording start/stop button is pressed to begin recording.
The electronic alarm beeps twice when the Recording start/stop button is pressed for record pause. This alarm helps prevent recording errors.

Rehearsal

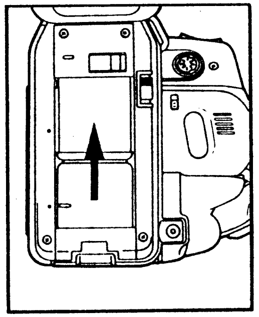


If you wish to rehearse shooting angles, compose scenes, etc., without actually recording on the tape, slide the control panel cover upward, slide the power switch on and press the PAUSE button. The scene will appear on the viewfinder screen. To disengage the Rehearsal mode, press the STOP button.

- Rehearsal is possible whether a cassette is loaded or not.
- With a cassette loaded, rehearsal is not possible during rewind or fast forward.
- The power save circuit does not function during rehearsal. (For power save function, see page 12.)

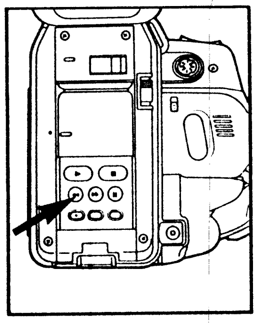
Viewfinder monitoring

1



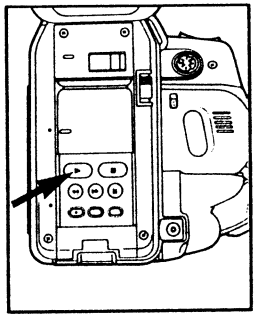
At the end of recording, slide the control panel cover up.

2



Rewind the tape to a point from which you want to check the recording.

3

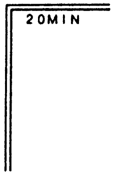


Press the PLAY button, and you can view the playback picture on the viewfinder screen.

Notes:
- Pressing the PAUSE button during playback stops the picture on the viewfinder screen.
- Shuttle search is also possible in both directions.

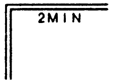
For TV playback, see page 17.

Remaining tape time indicator



The remaining tape time is displayed in the viewfinder as shown.

20 MIN → 15MIN → 10MIN → 5MIN → 4MIN → 3MIN → 2MIN → 1MIN → —MIN



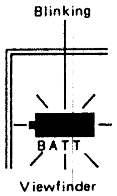
The remaining tape time indicator will blink as a warning a few minutes before the tape is finished.

Remaining tape time is being calculated when this bar is present in the viewfinder.

- The Stop mode engages automatically when the tape has reached its end during recording.
- The indicated remaining time is approximate.

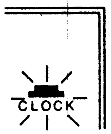
Warning

Battery warning

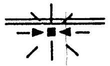


- When battery power is almost exhausted, a battery warning indication appears in the viewfinder. Replace the battery pack with a fully charged one. (See next page.)
- After this indication appears, the power turns off automatically. In this state, however, pressing the EJECT button turns the power on and ejects the cassette.

Lithium battery warning



- The lithium battery warning indicator will blink in the viewfinder if the battery is not set or when it needs to be replaced. (See page 14.)



- The low-contrast warning will blink when subject contrast is too low for accurate focusing. (See page 13.)

POWER SAVE AND TAPE PROTECTION CIRCUIT

- To save battery power, the GR-A30E (when battery-operated) switches itself off automatically in the following situations:
  (1) When left for longer than 5 minutes in the Stop mode.
  (2) When left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- To protect the tape, the GR-A30E (regardless of whether battery-operated or AC-powered) releases tape tension slightly and switches itself off automatically if left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- For the same reason, the GR-A30E enters the Stop mode and switches itself off automatically if left for longer than 5 minutes in the Still (Play-Pause) mode.

Battery operation

STOP → POWER OFF
5 minutes

Battery/AC operation

REC PAUSE → POWER OFF
5 minutes

PLAY PAUSE (STILL) → STOP → POWER OFF
5 minutes

ASSEMBLE RECORDING TECHNIQUE — 1 (To replace the battery pack during recording)

1 If the battery warning appears in the viewfinder while recording, stop recording by pressing the POWER switch to OFF, not the STOP button.

2 Replace the battery pack with a charged one.

3 Press the POWER switch to ON.
- The unit will be in the Recording Standby mode.

4 Press the recording start/stop button to start recording.

ASSEMBLE RECORDING TECHNIQUE — 2 (To record onto a partially recorded tape)

1 Play back the tape to a point where you wish a new recording to start.
- Use the FF or REW button faster location.
- To locate the point, press the FF or REW button during playback.

2 Press the PAUSE button at the located point.
- The unit will enter the Still mode.

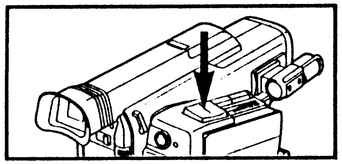
3 Slide the control panel cover downward.

4 Press the recording start/stop button to start recording.

SPECIAL TECHNIQUES

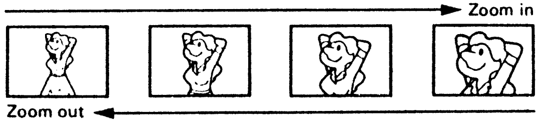
Zooming

When the focal length of the lens is varied by turning the zoom ring, the image appears to come nearer to or retreat from the viewer.



Power zooming

Press "T" for zooming in and "W" for zooming out.

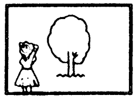


- **Focusing may become unstable during the zooming-in operation. In this case, first zoom in the Recording Standby mode then, after pressing the FOCUS LOCK button to hold the focus fixed, zoom in or out in the Record mode.**
- **When shooting low-contrast subjects in the Zoom-in mode, the VideoMovie automatically zooms out with the Focus lock mode indicator blinking and focus being performed.**

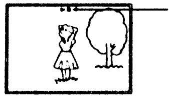
Focus lock

The GR-A30E's focus lock function is especially useful in the following situations:

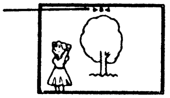
- When things are passing between your subject and the VideoMovie, make sure to engage the focus lock function, to lock your subject in focus before recording.
- If you want your main subject to appear in a corner of the screen, you should first center it at the desired distance, then use the autofocus mode for focusing, engage the focus lock function, and turn the VideoMovie till the subject is where you want it.
- Point the VideoMovie at another subject, the same distance from the camera as the one you want to record. Focus with the autofocus function and engage the focus lock mode. Now turn back to your desired subject and record it. When the low-contrast warning blinks, it means that accurate focus cannot be achieved.



The center of the viewfinder is focused in the Auto focus mode.



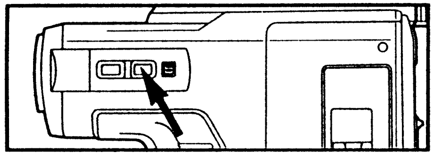
Press the FOCUS LOCK button, the indicator will blink in the viewfinder. Then aim the GR-A30E so that the subject is centered in the viewfinder.



Return to the original composition. The subject will remain in focus even though it is no longer in the center of the viewfinder.

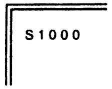
High-speed electronic shutter

The GR-A30E is equipped with a selectable high-speed shutter that allows better recording of quick movements for sharp, clear stills or slow-motion playback. Select this when taping fast-action shots that you will want to play back later in still or slow-motion mode using a video recorder with these modes.



1 Press the SHUTTER button to switch to the 1/1000-second electronic shutter. This can be done while recording or in any other mode. It continues until switched to standard speed.

2 When finished recording the fast-action scene, switch back to the standard shutter speed by pressing the SHUTTER button.



When selected, the High-Speed Shutter mode is indicated on the viewfinder screen.

Notes:

- The High-Speed Shutter mode requires slightly more subject illumination than the Standard Shutter mode. Therefore, the low-light warning may blink in the viewfinder. If so, switch to the Standard Shutter mode.
- Picture color may be adversely affected in the high speed shutter mode when the subject is lit by alternating discharge-type light sources such as fluorescent or mercury-vapor lights.

RECORDING THE DATE/TIME/AGE

Warning on lithium battery
- **Dispose of used battery promptly.**
- **Keep away from children.**
- **Do not disassemble and do not dispose of in fire.**

Battery insertion

- Switch off the unit's power before inserting the battery.

This battery powers the date/time/age function.

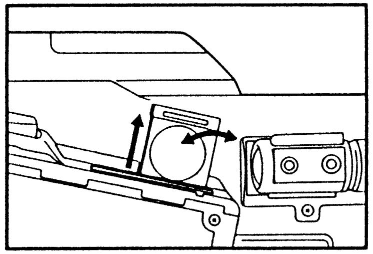
1. Lift the cover of the CLOCK BATTERY compartment, on top of the VideoMovie.
2. Insert the provided lithium battery **with the plus (+) side up.**
3. Close the cover on the unit until it clicks.

Battery replacement

The battery lasts for about one year. When the lithium battery warning (CLOCK) appears in the viewfinder, this battery needs to be replaced.

Replace the CR2025 lithium battery as follows:

1. Remove old battery by pressing knob.
2. Insert new CR2025, **plus side (+) up.**
3. Slide the cover back until it clicks.



Note:

Switch off the unit's power before removing old battery.

Replace battery with Matsushita type CR 2025 only.

Use of another battery may present risk of fire and explosion.

Date/time/age setting

Before adjusting the date, time and age for the first time or after replacing the batteries, indicating the clock needs to be set.

① Press PAUSE botton to enter rehearsal mode, and look through the viewfinder.

② Press the SELECT button – the day blinks.

③ Press the SET button to choose the correct number.

④ Press the SELECT button to select the next item to change, with the item selected changing in the following sequence:

→ Day → Month → Year → Hour → Minute
Finish Adjustment ← Year ← Month ← Day ←

⑤ Repeat steps ② and ③ to set all items. After the birth date setting has been performed, press the SELECT button, and items will cease blinking. Then the date, time and age will be displayed.

- The clock begins timekeeping when the minute portion stops blinking and lights constantly. When the date and time portions are blinking, the clock stops keeping time. Be sure to confirm the time when resetting the age.

Date/time/age recording

1. The date, time, or date and age can be displayed and recorded according to the selected mode. Press the DISPLAY MODE button to cycle throught the modes in the following order:

   Date/time/age display → Date/time display → Date/age display → Date display → Age display → Auto date display

2. When "Auto Date" appears in the viewfinder in the Recording Standby mode after the unit is powered, the date will be displayed automatically and be recorded for five seconds.
3. Press the DISPLAY ON/OFF button when you do not wish to record the date/time/age. This will remove the items from the viewfinder. Press again to record date/time/age. Date/time/age will reappear in the viewfinder.

Date/time/age recording indications

Date/time/age display	Date/time display	Date/age display	Date display	Age display	Auto date display
15 1 88 12:30 99Y11M	15 1 88 12 30	15 1 88 99Y11M	15 1 88	99Y11M	AUTO DATE Auto date record reserved

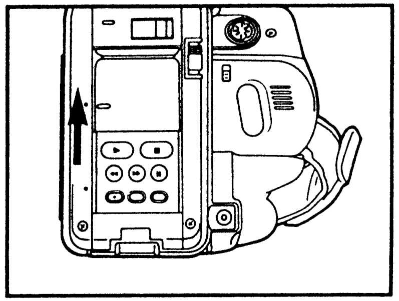
PLAYBACK

The GR-A30E permits playback of recorded VHS-C video cassettes.
For connections refer to pages 17, 18 and 19.

Preparations

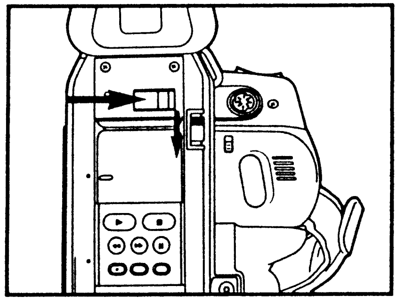
- ●With a television equipped with audio/video input connectors, set the television's TV/VIDEO switch to VIDEO.
- ●With a regular television receiver, set the antenna select switch of the RF-V3E (optional) RF unit to VIDEO and the TV receiver's channel selector to your video channel.
- ●Connect a power supply unit. (Battery or AC operation: see page 5.)

1



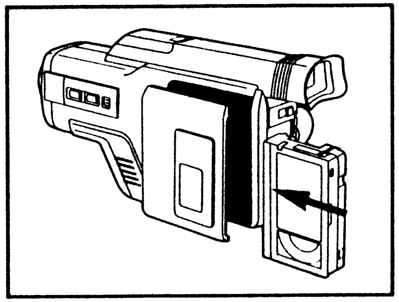
Set the control panel cover to DECK.

2



Slide the POWER switch to on and then press the EJECT switch.

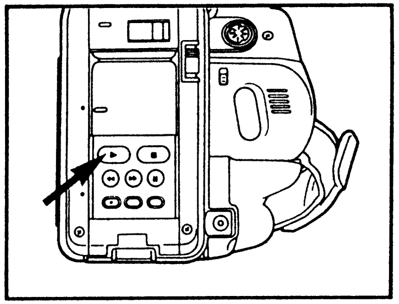
3



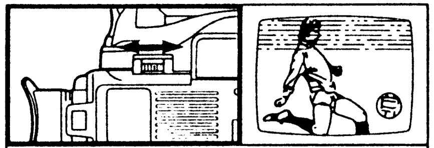
Insert a pre-recorded cassette.

Ensure that tape is not slack inside the cassette, then load the cassette correctly. See page 3.

4



Press the PLAY button. Playback will start.

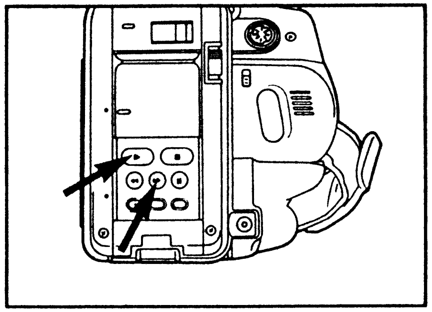


Tracking adjustment

If noise bars appear on the screen, adjust the TRACKING control. Turn it slowly in either direction to minimize noise bars. After playing a particular tape, return the TRACKING control to the center position.

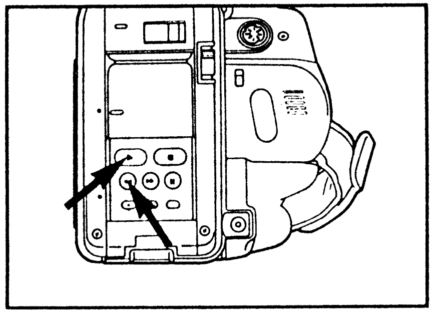
Shuttle Search

Fast-speed playback in the forward direction



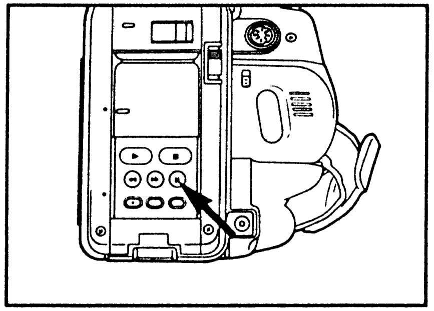
Press the FF button in the Play mode. Playback will be speeded up to 3 times normal speed while the button is being pressed.

Fast-speed reverse playback



Press the REW button in the play mode. The tape will be played back in the reverse direction at 3 times normal speed while the button is being pressed.

Pause playback



Press the PAUSE button during playback. The picture will stop on the screen.

- ●After about 5 minutes of pause playback, the unit enters the Stop mode automatically for tape protection and switches itself off.

Notes:

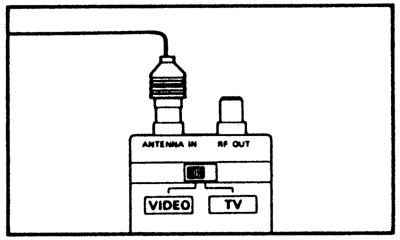
- ●Noise may appear on the screen during Shuttle Search and still playback. This is not due to any defect of the unit.
- ●Pictures may become monochrome during Shuttle Search mode. This is not due to any defect of the unit.

CONNECTION TO A TELEVISION FOR PLAYBACK

The GR-A30E includes playback circuits and allows playback of pre-recorded cassettes simply by connecting to a television set.

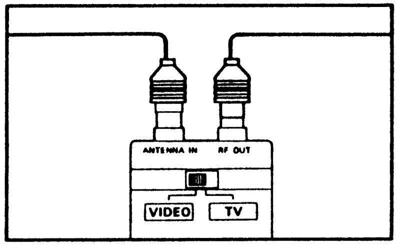
1 Remove the aerial cable from the TV receiver.

2



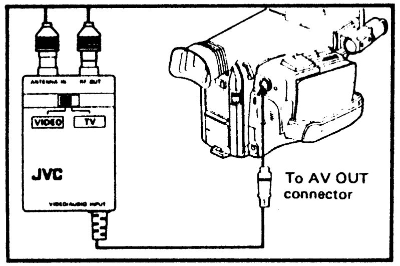
Connect the aerial cable to the ANTENNA IN terminal of the RF unit.

3



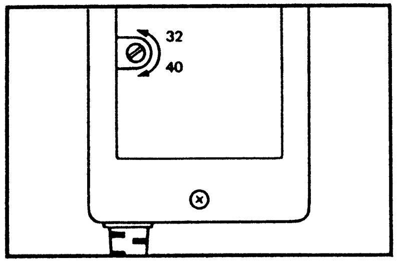
Connect the RF OUT terminal of the RF unit to the aerial terminal of the TV receiver using the aerial cable.

4



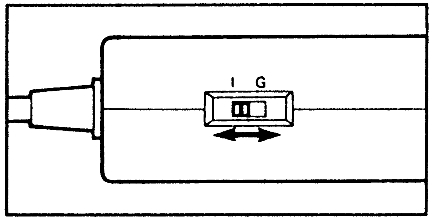
Connect the VIDEO/AUDIO INPUT cable fo the RF unit to the AV OUT connector of the GR-A30E.

5

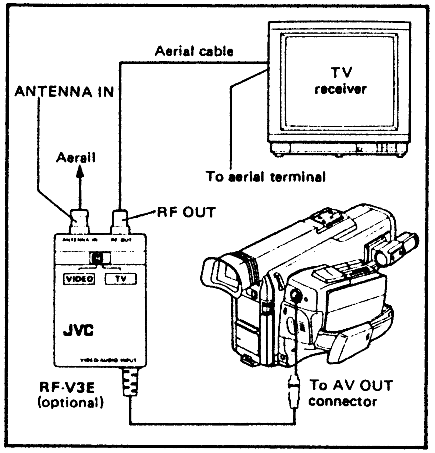


Adjust the RF converter output channel according to your VIDEO CHANNEL.

- **RF converter channel adjustment screw**
  The RF unit permits playback of video and audio recordings through a TV receiver. The signals from the RF unit are viewed through a vacant channel not used for broadcasting in your area. The output frequency of the RF converter has been set to correspond to a broadcast on UHF channel 36. To view playback pictures from the GR-A30E with your TV receiver, tune its specified AV channel to UHF channel 36. If channel 36 is employed for broadcasting in your area, readjust the RF converter output channel to one of the vacant channels between 32 and 40. To make this adjustment, remove the small cap on the back of the RF unit and turn the adjustment screw with a screwdriver to tune in a vacant channel.



- **TV system select switch (I/G)**
  When you use a TV receiver built to the British PAL standard, shift the system select switch to "I".



- **RF converter channel adjusting procedure**

1. Set the AV channel of the TV receiver to one of the vacant channels.
2. Power the GR-A30E.
3. Put the GR-A30E in the Rehearsal mode (see page 10).
4. Set the VIDEO/TV switch of the RF unit to VIDEO.
5. While monitoring the output signal on the TV screen, turn the RF converter channel adjustment screw so that the monitored picture comes in most clearly.

- When you wish to view video cassette programmes, always select the AV channel on the TV receiver which has been tuned to the output frequency of the RF converter.

PRECAUTIONS FOR RF-V3E (Optional)

- For exclusive use with the GR-A30E VideoMovie.
- Do not disassemble or remodel the RF-V3E.
- Do not expose it to strong shocks.
- Unplug the connected equipment during lightning storms. (Never touch the aerial cable.)

CAUTION:
To view the GR-A30E recordings with a TV receiver, use a TV receiver having a specified AV channel and employ this AV channel as your VIDEO CHANNEL, otherwise playback may be disturbed with vibrating or bending pictures. AV channels refer to channels exclusively for video playback; because of AFC circuits applied to these channels, the playback pictures can be stabilised. Recent TV receivers have one or more AV channels.

OPERATION

Viewing video cassettes being played back with the GR-A30E
To view video cassettes or to monitor the recording, set the VIDEO/TV switch of the RF unit to VIDEO and the TV channel selector to the channel corresponding to the RF output channel.

Viewing television programmes
Set the VIDEO/TV switch to TV, and the TV receiver will function as usual.

TAPE DUBBING OR EDITING

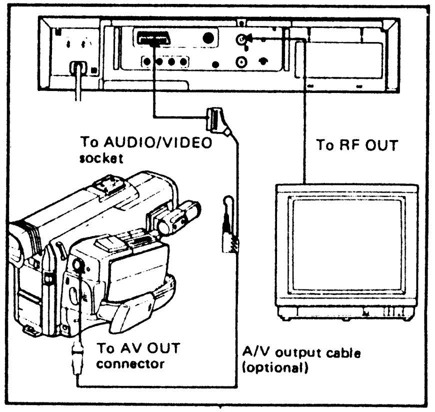
Dubbing onto a standard recorder

Connection

1. Connect the AV OUT connector of the GR-A30E to the AUDIO and VIDEO IN connectors of the video recorder using the optional AV output cable or a suitable dubbing cable.
2. Connect a television to the video recorder to monitor the picture while dubbing.

Operation

- Put the GR-A30E in the Play mode and the connected recorder in the Record mode to copy the recording. To edit out unwanted material, press the recorder's PAUSE button.

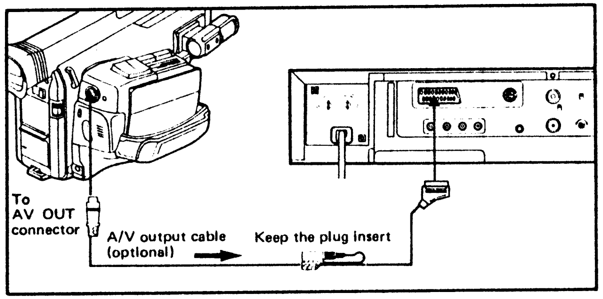


USING THE GR-A30E AS A VIDEO CAMERA

For continuous documentation of longer events, the GR-A30E can be used as an independent video camera in combination with either a deck-type or portable video recorder.

Using a recorder not equipped with a remote pause terminal

- Connect the AV OUT connector of the GR-A30E to the AUDIO and VIDEO IN connectors of the video recorder using a suitable dubbing cable.



Operation

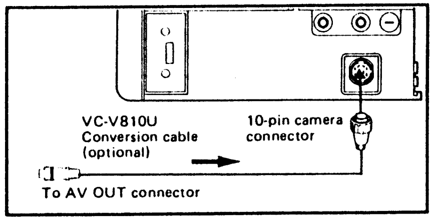
1. Press the PAUSE buttons. The camera output signal is now available via the dubbing cable.
2. Put the connected recorder in the Record mode. Recording will start. Tape start/stop should be controlled with the recorder's buttons.

Note:

- In this configuration, it is possible to obtain a continuous recording and an edited-out recording of the same event simultaneously, because the GR-A30E's start/stop button only controls the tape inside itself while another tape loaded in the connected recorder continues running. To record on the GR-A30E's tape, follow the same recording procedure as mentioned before: Slide the Camera control panel downward and Press the recording start/stop button.

Using a recorder equipped with a 10-pin camera connector

- Connect the AV OUT connector of the GR-A30E to the 10-pin camera connector of the JVC recorder using the optional VC-V810U conversion cable.



Operation

1. Press the PAUSE button.
2. Put the connected recorder in the Recording Standby (Record-Pause) mode.
   - The viewfinder's mode indication corresponds to the state of the connected recorder.
3. Press the start/stop button of the GR-A30E to start recording.

Note:

- To record on the GR-A30E's tape as well, press VideoMovie's start/stop button.

Precautions

- Power is not supplied to the GR-A30E from the connected VCR. Independent power supply is required for both the GR-A30E and the VCR.
- If you stop recording by pressing the GR-A30E's start/stop button, the connected VCR also stops in the Pause mode. However, the pause command signal is not delivered to the connected VCR in the following cases and, therefore, the VCR will start automatically:
  (1) when the GR-A30E is switched off or its battery becomes discharged.
  (2) when the VC-V810U cable is disconnected.
  Therefore, before replacing the battery or tape for the GR-A30E, put the connected VCR either in the STOP or REC LOCK mode.

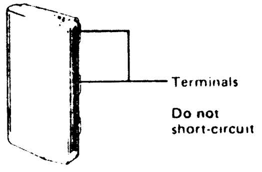
CHARGING THE BATTERY PACK

To charge the battery pack, use the exclusive AC power adapter/battery charger AA-V5EG (provided/optional) or car battery charger BH-V5E (optional).

Note:
The AA-V5EG AC Power adapter/battery charger will accept 110 V and 240 V power supplies. Selection is automatic and no adjustment is required.

A WORD ON THE EXCLUSIVE BN-V5GU/V6GU/V7GU BATTERY PACKS

The BN-V5GU/V6GU/V7GU are nickel-cadmium batteries. Give attention to the following to make the most of their characteristics.



Temperature ranges:
The recharging time is based on room temperature of 20°C.
The lower the temperature, the longer the recharging time.
For charging: 10°C to 35°C
For operating: 0°C to 40°C
For storing: −10°C to 30°C

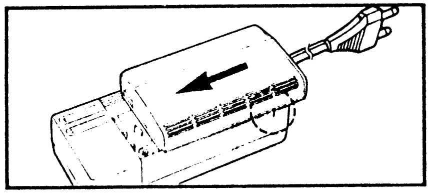
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, charge it.
BE SURE TO CAREFULLY READ THE CAUTION ATTACHED TO THE BATTERY PACK.

Charging procedure

Charging time

BN-V5GU 50 min.	BN-V6GU 70 min.
BN-V7GU 80 min.	

- The charging time differs depending on the ambient temperature and the condition of the battery pack.



1. Connect the AC power cord to a wall outlet. (The POWER indicator will light.)
2. Align the marks on the battery pack and adapter.
3. Slide the battery pack in the direction of the arrow until it locks in place.
4. When charging is completed, the CHARGE indicator goes out.

PRECAUTIONS

- If used near a radio, the provided AA-V5EG AC power adapter/battery charger may interfere with reception.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not disassemble or modify the unit.
- Do not apply shocks to the unit.
- Do not subject the unit to direct sunlight.
- Avoid using the unit in extremely hot or humid places.
- Avoid using the unit in places subject to vibrations.

Note:
The optional BH-V5E Car Battery Charger can charge the batteries from a car battery. For details refer to the instructions of the BH-V5E.

Recording time for the GR-A30E

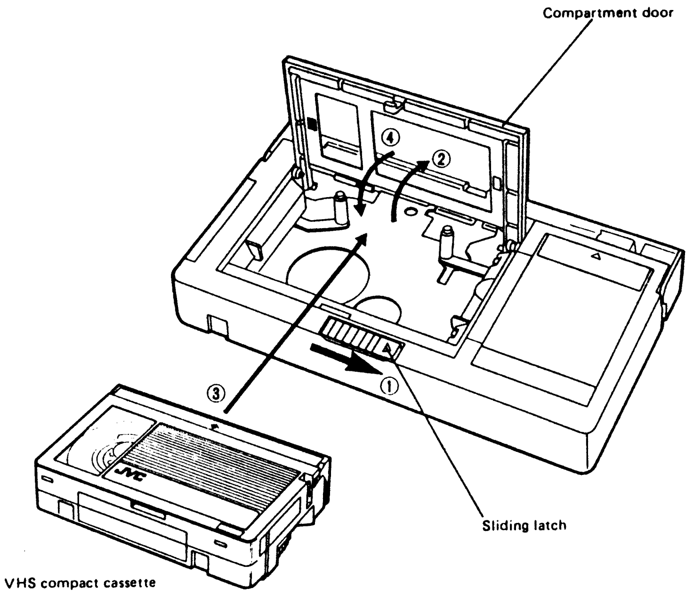
BN-V5GU 20 min.	BN-V6GU 50 min.
BN-V7GU 75 min.	

- The recording time per charge is influenced by the duration of recording standby, frequency of zooming, etc. It is safer to have spare battery packs.

USING THE CASSETTE ADAPTER (provided)

The VHS compact video cassettes recorded with the GR-A30E can be played back with a standard VHS machine by using the provided C-P5U Cassette Adapter.
(A compact video cassette installed in the cassette adapter is fully compatible with a standard VHS machine for both recording and playback.)

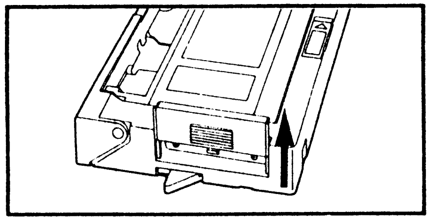
- **C-P5U Cassette Adapter**
  Being battery-operated, the C-P5U performs tape loading and unloading automatically.



Note:
- During special-effects playback (slow motion, still frame, etc.) the picture may vibrate or noise bars may appear on the screen.

Inserting the battery into the cassette adapter

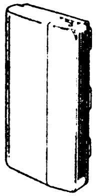
Remove the battery cover by sliding it up.
Install one "R6" battery and reattach the cover.



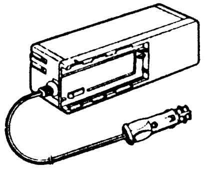
SYSTEMS FLEXIBILITY

For maximum enjoyment, make the most of the provided or optional accessories depending on the situation.

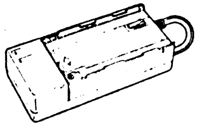
- **Regular battery pack BN-V5GU**
  ☞ **Page 5**
- **High-capacity battery pack BN-V6GU**
  ☞ **Page 5**
- **Super-high-capacity battery pack BN-V7GU**
  ☞ **Page 5**



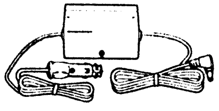
- **Car battery charger BH-V5E**
  ☞ **Pages 5 and 20**
  Use to charge the battery pack, or power the GR-A30E using a car battery.



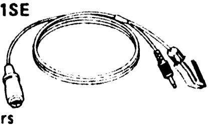
- **AC power adapter/battery charger AA-V5EG**
  ☞ **Pages 5 and 20**
  Use to power the GR-A30E with household AC current or to charge the battery pack.



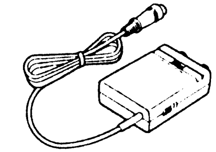
- **Car battery cord AP-P1E**
  ☞ **Page 5**
  For power supply from a car battery.



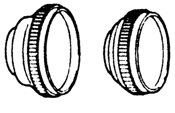
- **AV output cable VC-V8961SE**
  ☞ **Pages 18 and 19**
  Use to connect the GR-A30E to a television set equipped with audio/video input connectors for playback, or to a second video recorder for dubbing.



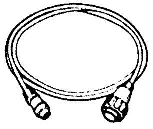
- **RF unit RF-V3E**
  ☞ **Pages 17 and 18**
  Use to connect the GR-A30E to a regular TV receiver for playback.



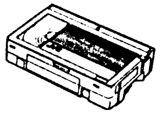
- **Conversion lens kit GL-V157U**
  For a change of perspective attach the 1.5X teleconversion lens to boost the Telephoto power 1.5 times or reduce the Wide-Angle coverage by an equivalent amount (0.7 times).



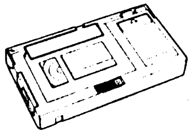
- **Conversion cable VC-V810U**
  ☞ **Page 19**
  For connecting the GR-A30E to a VCR with a 10-pin camera connector



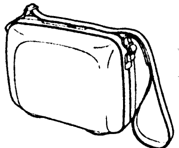
- **Compact video cassette EC-30**
  ☞ **Page 3**
  Allows 30 minutes of recording and playback.



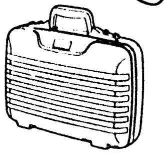
- **Cassette adapter C-P5U**
  ☞ **Page 21**
  Enables the EC-30 compact video cassette to be used with regular VHS machines.



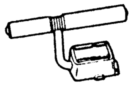
- **Carrying bag CB-V22U**
  Use to carry GR-A30E together with basic accessories.



- **Carrying case CB-V32U**
  Use to carry GR-A30E together with accessories.

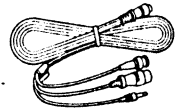


- **Carrying handle VU-V130U**
  Use to carry the GR-A30E.

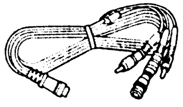


AV dubbing cables
For connecting VCRs which do not accept the VC-V8961SE, these cables are also avialable optionally.

- **AV dubbing cable VC-V856E**
  With BNC connector for video and 5-pin DIN connector for audio.



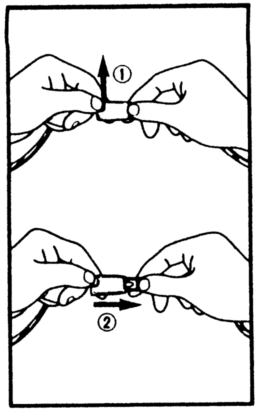
- **AV output cable VC-V826E**
  With BNC connector/RCA phono jack for video and RCA phono jacks for audio.



Choose the appropriate cable depending on the type of VCR you have.

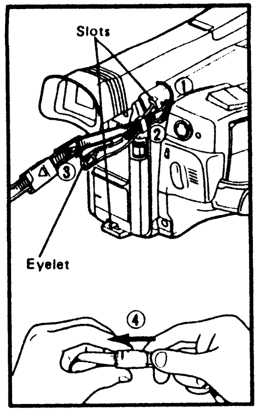
ATTACHING THE SHOULDER STRAP

1



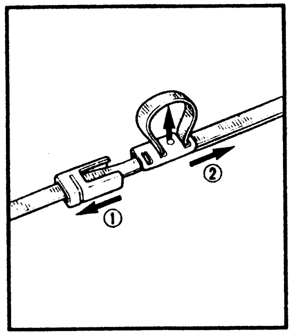
While pressing the release button down and sideway ①, slide the buckle out of the buckle shell in the direction of the arrow ②.

2



Guide the end of the strap through the slot on the GR-A30E ① and the keeper ②, and fasten the strap's eyelet on the buckle's hook ③. Then slide the buckle back, as shown, until it clicks ④.

How to adjust the length of the shoulder strap



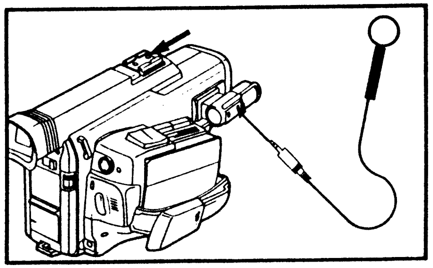
1. While pressing the release button, slide the buckle out and pull some slack through the buckle.
2. To lengthen the strap, feed the strap from ② toward ①. To shorten it, feed it from ① toward ②.

CAUTION

- Do not attach a video light, other wise its heat could cause malfunction of the VideoMovie.

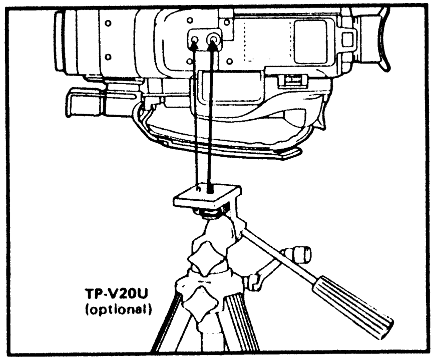
EXTERNAL MICROPHONE

To use another microphone, do the following:



Plug the external micrphone's cord into the microphone jack.

TRIPOD MOUNTING



Align the screw and camera direction stud of the tripod with the camera's tripod mounting socket and stud hole, and firmly tighten the screw.

SUPPLEMENTAL INFORMATION

What is "colour temperature"?

Light is composed of various colour components in different proportions. A relationship exists between the temperature of a light source and the colour components of the emitted light; as the temperature rises, the colour of the light varies from red, orange, yellow, white to blue in that order. "Colour temperature" is a value that expresses differences in colour among light sources, measured in Kelvin degrees. Bluish light has a higher colour temperature than reddish light.

What is "white balance"?

Making the colours look natural on TV is what white balance is all about. Because a camera is not as adaptable as the human eye, if a light source is reddish, white subjects in that light are recorded as reddish. White balance adjustment is performed to compensate for colour temperature variations of light so that whites are reproduced as white. Correct white balance makes all other colours correct. The GR-A30E can perform automatic white balance adjustment. However, if illumination is insufficient, white balance adjustment cannot be performed. To obtain correct colours, therefore, sufficient illumination is essential.

What is "illuminance"?

"Illuminance" (also called 'luminance') is the intensity or brightness of light, expressed in lux. The GR-A30E is designed to provide best pictures under the conditions of a 700-lux illuminance, although shooting is possible all the away down to 10 lux. To obtain good pictures in very bright light, the use of an ND (neutral density) filter is recommended. (See chart on this page.)

How to get good colour pictures

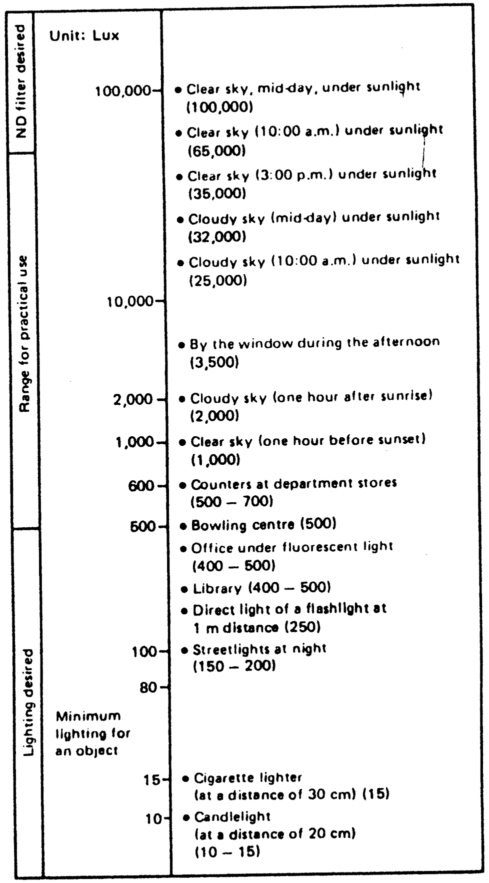
The simplest way is to provide sufficient lighting (close to the camera's reference illuminance) and accurately adjust the camera to the colour temperature of that lighting. If light sources of different colour temperatures are used together, accurate white balance adjustment is very difficult. For example, if natural light is mixed with artificial light, which is likely to occur next to windows, correct colours of the subject are difficult to obtain. It is recommended in such cases that curtains in the room be closed to shut out light from outside. Also, when artificial lighting devices are used, they should all have the same colour temperature. For example, it is recommended that incandescent or halogen lamps not be used together with fluorescent lighting.

Colour temperatures of various artificial lighting

Type of illumination		Colour temperature
Tungsten lamp for home use		2800 K
Tungsten lamp for photographic use		3200 K
Quartz-halogen lamp		
Blue lamp for photographic use		5000 K
Fluorescent lamp	Warm white	3500 K
	White	4500 K
	Daylight type	6500 K

Illuminance chart

- The values on this chart are approximated to give you a rough reference.



IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

Symptoms	Check points
Power	
No power is supplied	●Is the battery pack correctly installed? ●Is the battery pack charged? ●Is the power supply unit correctly connected? ●Is the POWER switch of the connected AC adapter set to ON?
Recording	
Recording is impossible.	●Check to see if the cassette safety tab is in place. See page 3. ●Is the camera control panel cover all the way down?
No sound is recorded with an external microphone.	●Is the microphone's switch set to ON?
Playback	
Tape is running, but no playback picture appears.	●Is the TV/VIDEO switch of the RF unit set to VIDEO? ●Is the TV receiver set to your video channel? ●If A/V connection is used, is the TV's VIDEO/TV switch set to VIDEO?
Noise bars appear in the playback picture.	●Use the TRACKING control to reduce noise bars.
Playback picture is blurred or interrupted while TV programs received are clear.	●Video heads may be dirty or worn out. For head cleaning or replacement, consult the nearest JVC Dealer.
Tape transport	
Rewinding or fast forwarding is impossible.	●Check to see if the tape has already been fully wound on one reel or the other.
Other	
Vertical white lines appear when shooting a very bright object.	●This may occur when the background contrasts very much with the object. This is normal.

The GR-A30E is a microcomputer-controlled device. External noise and interference might prevent it from functioning properly. In such cases, first disconnect its power supply unit (battery pack, AC power adapter, lithium battery, etc.); and then reconnect it and proceed as usual from the beginning.

SECTION 1
SERVICE CAUTION AND DISASSEMBLY

1.1 PRECAUTIONS

1. Disconnect the power from the set before removing/re-assembling or soldering components.
2. When removing/re-assembling fasteners such as screws, washers, be careful not to drop them into the mechanism.
3. When disconnecting/removing/re-assembling connectors, pay enough attention to every flexible wire and wiring not to damage it.
4. In principle, resistors, shorting jumpers (0 ohm resistance), ceramic capacitors, diodes are all chip parts. These chip parts cannot be reused after they are once removed from the unit. (Refer to Section 1.3.)
5. Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustment only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available. Especially, when any VR of the camera section is turned without permission, all VRs need adjustments.
6. When removing/re-assembling component parts, be careful not to damage them or displace other parts. (Be especially careful about the video head ass'y and the tape transport mechanism.)
7. Pay enough attention to the CCD image sensor and optical filters so that they won't be dusty, soiled or damaged. If it is soiled with fingerprints, etc., clean gently with silicon lens tissue or chamois.
8. When removing ICs, be careful not to damage circuit patterns. (This also applies to do re-assembling.)

1.2 REQUIRED TEST EQUIPMENTS, FIXTURES/TOOLS AND OTHERS

For proper measurement, adjustment and maintenance, the following test equipment, fixtures/tools are strongly recommended.

1.2.1 Test equipments

1. Oscilloscope (dual-trace, more than 20 MHz)
2. Vectorscope
3. Frequency counter
4. Audio tester
5. Color video monitor
6. Halogen lamps

1.2.2 Tools

1. Screwdriver with nonmagnetic 0.35 mm bit.
2. 1.5 mm hexagonal wrenches.
3. Fine tipped, well insulated soldering "pencil" (with absorbent) : Temp 130°C –260°C.

1.2.3 Fixtures

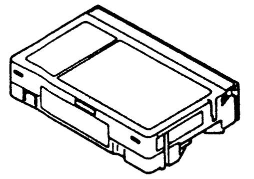
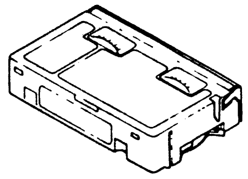
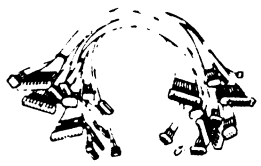
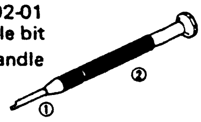
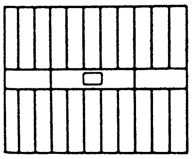
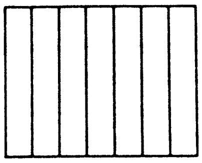
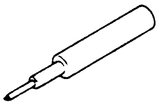
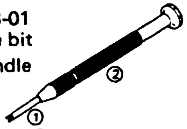
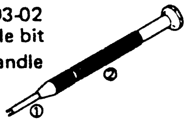
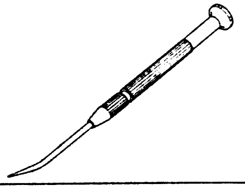
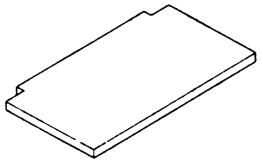
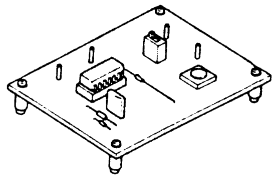
Alignment tape MH-C2	Cassette torque meter PUJ50431-2	Patch cords YTU93016A	A/C head positioning tool ass'y YTU93002A (incl. ① & ②)
			① YTU93002-01 Changeable bit ② PD-3.0 Handle  Order for ① or ② can be placed separately.
Grey scale pattern (GS-2A) Reflection type, 11 steps, $\gamma = 2.2$	Color bars pattern (CC-2A) Reflection type, 7 colors	Adjusting jig for compact VTR YTU93004	Chip parts replacing jig YTU93003A (incl. ① & ②)
			① YTU93003-01 Changeable bit ② PD-3.0 Handle  Order for ① or ② can be placed separately.
Chip parts replacing jig YTU93003B (incl. ① & ②)	Chip IC replacing jig PTS40844	Lens hood replacement tool YTU93019	AF adjustment tool YTU93020
① YTU93003-02 Changeable bit ② PD-3.0 Handle  Order for ① or ② can be placed separately.			

Table 1-2-1 Fixtures

1.3 REPLACEMENT OF CHIP PARTS

For replacing chip parts, proceed it as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1.3.1 Soldered condition of chip parts

- Resistors, capacitors, etc.

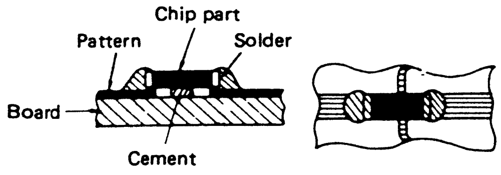


Fig. 1-3-1 Soldering condition-1

- Transistors, diodes, etc.

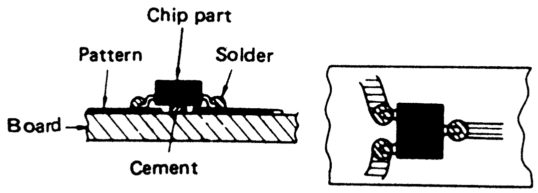


Fig. 1-3-2 Soldering condition-2

1.3.2 How to remove chip parts

- Resistors, capacitors, etc.

1. Set a chip parts replacing tool onto the chip parts to hold it down.
2. Unsolder at a side of the chip parts.

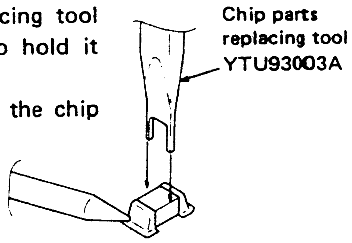


Fig. 1-3-3 R/C removal-1

3. Remove the chip parts by twisting and sliding it.

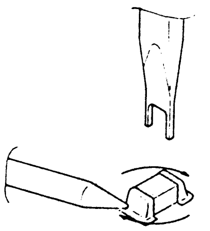


Fig. 1-3-4 R/C removal-2

- Transistors, diodes, etc.

1. Unsolder at the one-lead side of the chip parts.

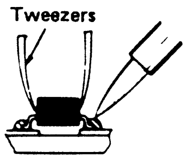


Fig. 1-3-5 Tr/Diode removal-1

2. Lift the unsoldered side upwards.

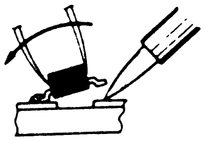


Fig. 1-3-6 Tr/Diode removal-2

3. Heat the other two leads simultaneously and remove the chip parts upwards.

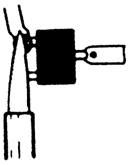


Fig. 1-3-7 Tr/Diode removal-3

1.3.3 Preheating and soldering

When setting new chip parts, especially capacitors, but except transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before solderingg. For soldering, use a soldering iron of 30 W approx.

1.3.4 How to set and solder chip parts

1. Presolder the contact points of the circuit pattern, to which the chip parts will be soldered.

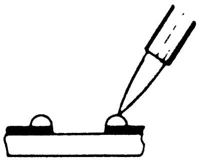


Fig. 1-3-8 Soldering-1

2. Holding down the chip parts with the chip parts replacing tool, solder it with a soldering iron.

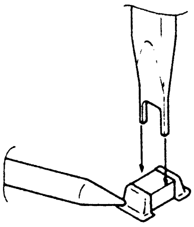


Fig. 1-3-9 Soldering-2

1.4 REMOVING OF FLAT ICs
(Recommendable manner)

1. For removing solder chips from IC's pins, use a solder remover or a wiry solder absorber.
2. Heat the IC's tips evenly by moving the chip IC replacing jig around them, and detach the IC's leads with a tool in the way of using a lever.
3. Do not reuse ICs removed once. (Discard them.)

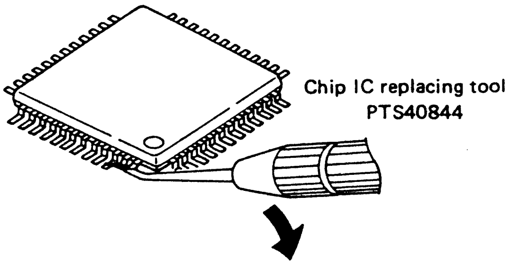


Fig. 1-4-1 Flat IC removal

1.5 DISASSEMBLY OF CAMERA SECTION

1.5.1 Electronic viewfinder and operation unit

1. Move the shoe cover in the direction of ⓐ and detach it from the viewfinder.
2. Remove four screws Ⓐ and lift the viewdinfer in the direction ⓑ. Then, by disconnecting the flexible wire Ⓑ from the connector on the back of the viewfinder, the viewfinder can be detached from the main body of the camera.
3. Remove two screws Ⓒ to detach the VF (viewfinder) shoe.
4. To remove the VF shoe spring, lift it up by the pawl and move it in the direction ⓒ.
5. Remove four screws Ⓓ and detach the operation unit. At this time, pay careful attention to two connectors Ⓔ and Ⓕ which connect it with the trigger switch and the MAIN board, respectively.

1.5.2 Cassette cover, front pad, lens hood, front panel, upper case and microphone

1. Remove two screws Ⓐ and take off the cassette cover.
2. Remove four screws Ⓑ and detach the front pad.
3. Next, remove the lens hood with the lens hood removement tool (YTU93019). At this time, Set the implement firmly into the notch of the lens hood and turn it in the direction of the arrow mark (see Fig. 1-5-2).
4. Remove four screws Ⓒ and take off the front panel.
5. Remove three screws Ⓓ and a screw Ⓔ, and disconnect two connectors of the CTL board attached to the upper case (a connector Ⓕ from CN-S2 of the IMS/SSG board and the other Ⓖ from CN7 of the AF board).
   Then, the upper case can be detached from the body.
6. To detach the microphone, remove a screw Ⓗ, disengage pawls from the lower case, and disconnect a connector Ⓘ coming from CN3 of the AV board.

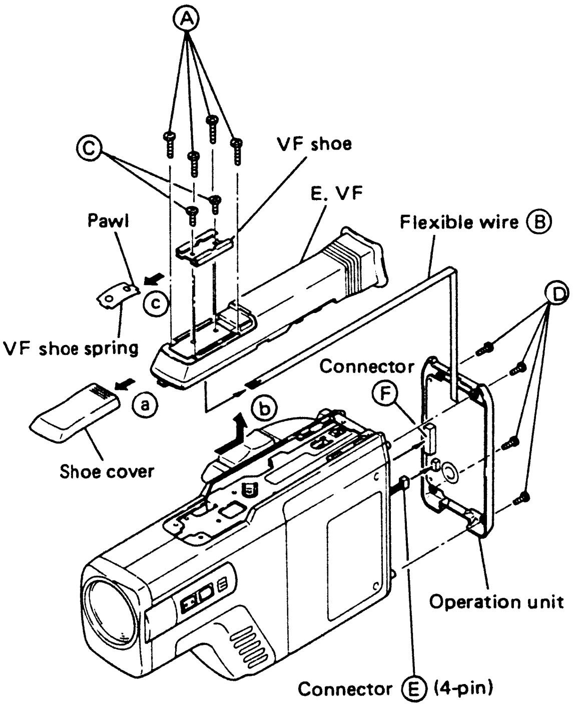

Ⓐ
Ⓒ
VF shoe
E. VF
Pawl
Flexible wire Ⓑ
ⓒ
Ⓓ
VF shoe spring
Connector
Ⓕ
ⓐ
ⓑ
Shoe cover
Operation unit
Connector Ⓔ (4-pin)

Fig. 1-5-1 E.VF/Op. unit removal

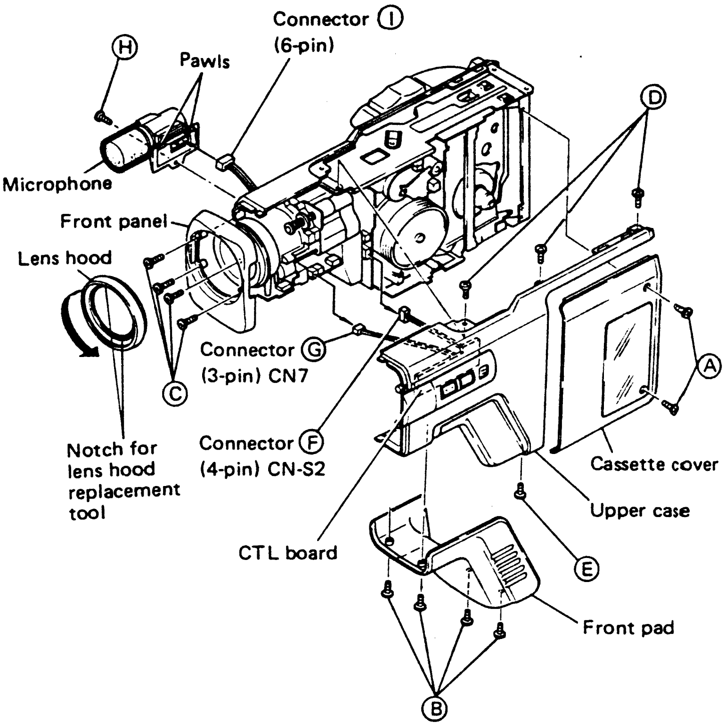

Connector Ⓘ
(6-pin)
Ⓗ
Pawls
Ⓓ
Microphone
Front panel
Lens hood
Connector Ⓖ
(3-pin) CN7
Ⓒ
Ⓐ
Notch for lens hood replacement tool
Connector Ⓕ
(4-pin) CN-S2
Cassette cover
Upper case
CTL board
Ⓔ
Front pad
Ⓑ

Fig. 1-5-2 Case/Cover removal

1.5.3 Lower case

1. Remove two screws Ⓐ.
2. Remove screws Ⓑ, Ⓒ and Ⓓ.
3. Disconnect a connector Ⓔ of the zoom switch from CN4 of the AF board while a connector Ⓕ of the battery terminal from CN11 of the MAIN board. Then, the lower case can be detached from the main body.

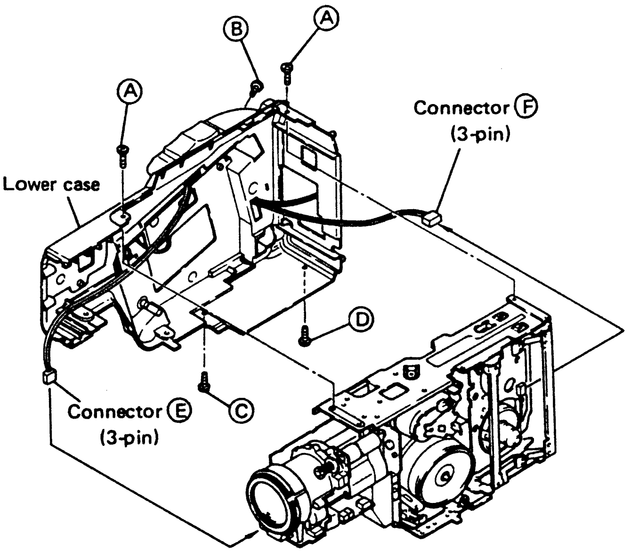

Ⓑ
Ⓐ
Ⓐ
Connector Ⓕ
(3-pin)
Lower case
Ⓓ
Connector Ⓔ
(3-pin)
Ⓒ

Fig. 1-5-3 Lower case removal

1.5.4 Battery base

1. Remove three screws Ⓐ and a sccrew Ⓑ.
2. Disconnect a connector Ⓒ of the backup battery from the connector of the TRIGGER SW board, and then take off the battery base.
3. In addition, the TRIGGER board can be taken off by removing the trigger board holder.

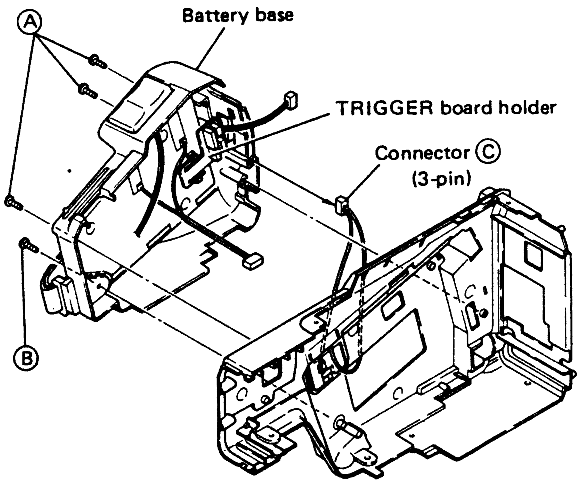

Ⓐ
Battery base
TRIGGER board holder
Connector Ⓒ
(3-pin)
Ⓑ

Fig. 1-5-4 Battery base removal

1.5.5 Camera section

1. Remove two screws Ⓐ.
2. To detach the camera section from the deck section, draw out it in the direction of the arrow Ⓓ since they are connected by two connectors Ⓑ and Ⓒ.

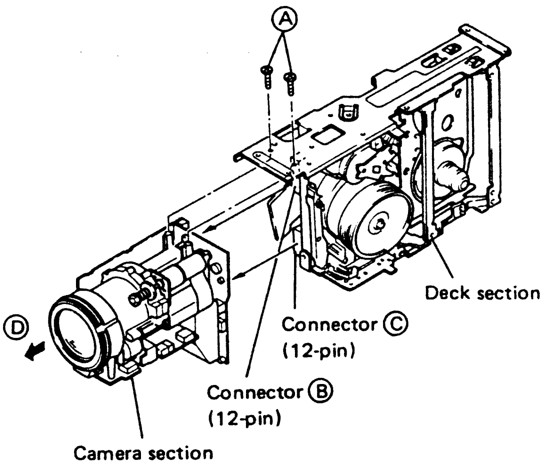

Ⓐ
Deck section
Ⓓ
Connector Ⓒ
(12-pin)
Connector Ⓑ
(12-pin)
Camera section

Fig. 1-5-5 Camera section removal

1.5.6 Camera operation after separation

When operating the camera section after separation, connect the following patchcords.

① CN-V2 of VIDEO board ←——→ CN62 of MAIN board
② CN-V3 of VIDEO board ←——→ CN61 of MAIN board
③ CTL board ←——→ CN-S2 (4-pin) of IMS/SSG board
④ CTL board ←——→ CN7 (3-pin) of AF board
⑤ ZOOM SW ←——→ CN4 of AF board
⑥ CN2 of TRIGGER SW ←→ CN3 of OPERATION board
⑦ CN51 of MAIN board ←→ CN1 of OPERATION board

Then connect the AV OUT terminal of the deck section with a color video monitor by an AV output cable, and connect the video monitor with a vectorscope.
Supply the specific power from an AC power adapter (AA-V5U, or equivalent) for adjustments whose details are described in following sections.

This setup and connection apply to adjustments of the deck section, too.

Note: When measuring the inside of camera boards, use the patch cords which is shown overall wiring on section 4.

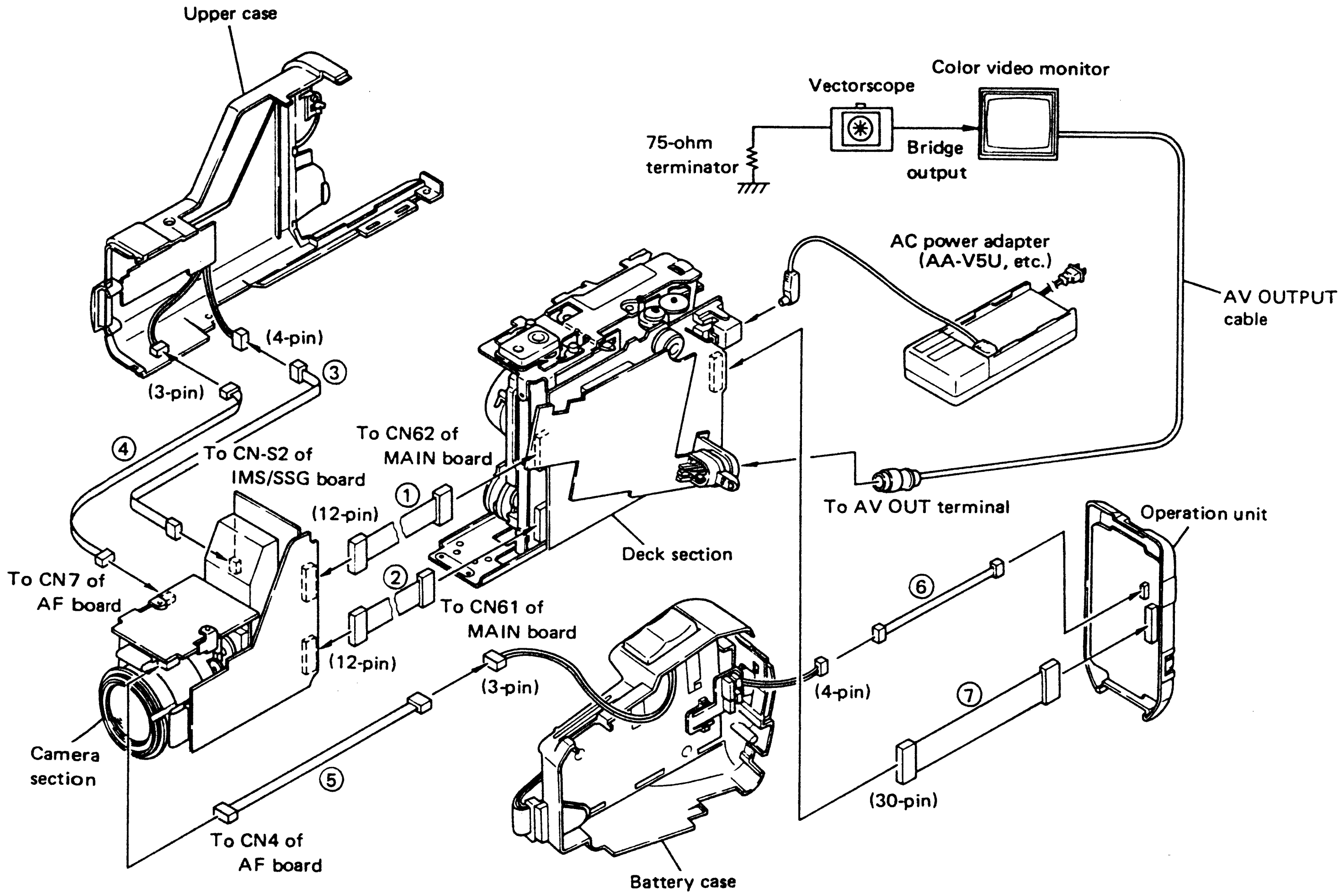

Upper case
Color video monitor
Vectorscope
75-ohm terminator
Bridge output
AC power adapter (AA-V5U, etc.)
AV OUTPUT cable
(4-pin)
③
(3-pin)
④
To CN-S2 of IMS/SSG board
To CN62 of MAIN board
①
(12-pin)
To AV OUT terminal
Operation unit
Deck section
To CN7 of AF board
②
To CN61 of MAIN board
⑥
(12-pin)
(3-pin)
(4-pin)
⑦
Camera section
⑤
(30-pin)
To CN4 of AF board
Battery case

Fig. 1-5-6 Camera or Deck section operation

1.5.7 Camera section's boards

1. To detach the VIDEO board, disconnect a connector Ⓐ connecting it with the IMS/SSG board, connector Ⓑ connecting with the DC-DC converter, and flexible wire Ⓒ coming from the AF board.
2. To detach the IMS/SSG board, remove two screws Ⓓ and disconnect pins of the CCD image sensor (OP block) from the socket Ⓔ of the IMS/SSG board. At this time, pay the most careful attention to pins since they are apt to be bent and damaged. Then, disconnect a connector Ⓕ connecting it with the iris motor and another connector Ⓖ connecting it with the DC-DC converter.
3. To detach the AF board, remove two screws Ⓗ and disconnect connectors Ⓙ (connecting it with the zoom encoder), Ⓚ (with the infinity sensor), Ⓛ (with the AF motor), and Ⓜ (with the zoom motor).

1.5.8 CCD image sensor

Notes:

1) Pay the most careful attention to the transparent glass and optical filters of the CCD image sensor not to soil and damage them. If it is soiled with fingerprints, etc., gently clean it with silicone-processed paper/cloth or chamois.

2) When the CCD image sensor is shipped from the factory, there are orange protection seals applied onto the transparent glass. Leave the protector as it is, and take it off just before assembling the CCD imate sensor to the OP block.

1. Removal

1) Remove two screws Ⓐ securing the imager holder Ⓑ.

2) Remove two screws Ⓖ securing the filter holder Ⓕ first and detach the optical low-pass filter Ⓔ, rubber Ⓓ, CCD image sensor Ⓒ, and imager holder Ⓑ one after another.

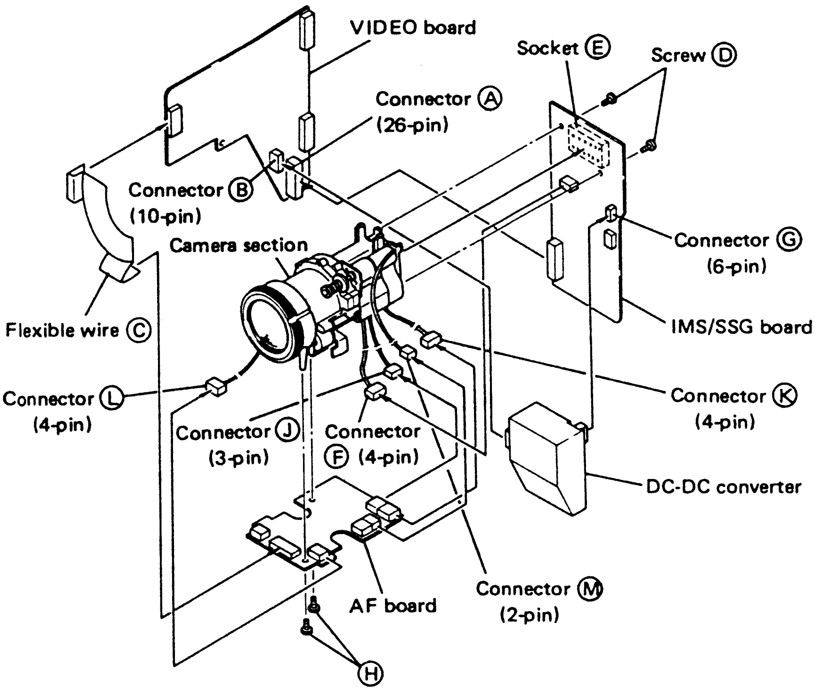

VIDEO board
Socket Ⓔ
Screw Ⓓ
Connector Ⓐ
(26-pin)
Connector Ⓑ
(10-pin)
Camera section
Connector Ⓖ
(6-pin)
IMS/SSG board
Flexible wire Ⓒ
Connector Ⓛ
(4-pin)
Connector Ⓚ
(4-pin)
Connector Ⓙ
(3-pin)
Connector
Ⓕ (4-pin)
DC-DC converter
AF board
Connector Ⓜ
(2-pin)
Ⓗ

Fig. 1-5-7 Boards removal

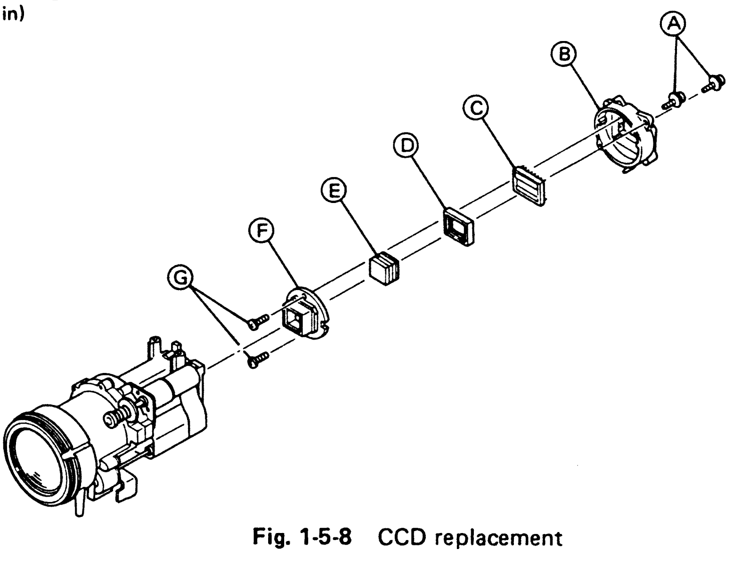


Fig. 1-5-8 CCD replacement

2. Installation

1) Remove the protection seal from a new CCD image sensor Ⓒ and set it on the imager holder Ⓑ. Next, put the space rubber Ⓓ, optical filter Ⓔ and filter holder Ⓕ on the CCD image sensor as they are piled up in this order.
At this time, pay attention to the following matters.

Parts	Caution at assembling
Imager holder Ⓑ	Set the side with parts number (back side) down.
CCD image sensor Ⓒ	Set the side with marking down.
Space rubber Ⓓ	Set the IC side horizontally.
Optical filter Ⓔ	Set the marking to be positioned under.

2) Fix the filter holder to the imager holder Ⓑ with two screws Ⓖ.
3) Paying careful attention to the setting direction of the imager holder Ⓕ, fix it to the OP block with two screws Ⓐ.
4) After putting together all P.C. boards of the camera section, observe the monitor to check up that there is no vignetting caused by the bodytube, rings, lens hood, etc. If no vignetting is observed, it can be said that image's parallelism, horizontality and centering are correct.
5) After completion of the above assembling work, perform the specified adjustments of the camera section.

1.6 DISASSEMBLY OF DECK SECTION

Disassembly of the deck section must be performed after the works of Sections 1.5.1 to 1.5.3 and 1.5.5 for disassembling the camera section.
Setup and connection for adjustments of the deck section are illustrated in Fig. 1-5-6. After the connection, proceed to adjust the deck section according to the adjustment procedure to be described later.

1.6.1 Frame bracket and base bracket

1. Remove three screws Ⓐ and take off the frame bracket.
2. Remove three screws Ⓑ and a screw Ⓒ to take off the base bracket.
   At this time, the end sensor bracket is taken off, too, since one of the screws Ⓑ secures it together with the base bracket.

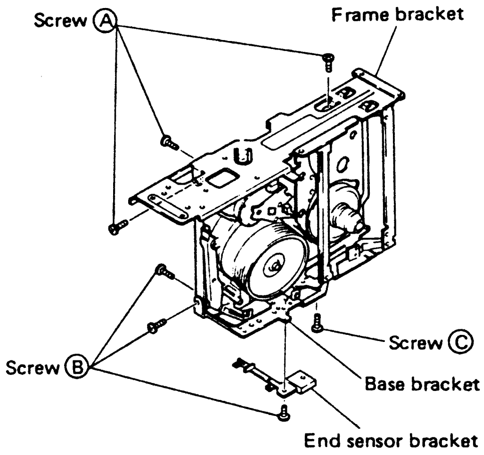


Fig. 1-6-1 Frame/base bracket removal

1.6.2 The deck section's P.C. boards

1. Disconnect a connector Ⓐ of the A/C head from CN1 of the A/V board. Next, remove two board spacers Ⓑ and disconnect a connector Ⓣ from CN32 of the MAIN board. Then, the A/V board can be detached.
2. Remove two screws Ⓓ and a screw Ⓔ . Three screws Ⓒ don't remove. Disconnect a flexible wire Ⓕ of the capstan motor from CN23 of the MAIN board. On the other hand, disconnect a connector Ⓖ of the A/C head from CN21 of the MAIN board and connector Ⓗ of the cam encoder from CN42 of the MAIN board and connector Ⓣ of preamp from CN71 of the MAIN board besides disconnection of connectors Ⓠ , Ⓡ and Ⓢ which also connect the MAIN board with the deck section.
3. Remove two screws Ⓙ and disconnect a flexible wire Ⓚ of the drum motor from CN252 of the MDA board and disconnect a connector Ⓛ of the dew sensor from CN253 of the MDA board. Then, the MDA board can be detached.
4. To detach the preamp, remove two screws Ⓜ and disconnect a flexible wire Ⓝ connecting it with the video head.
5. By removing two screws Ⓟ, the cassette housing can be taken off.

1.6.3 Deck operation after removal of boards

1. Refer to section 1.5.6.
2. When measuring the inside of the board, use the other patchcords which is shown overall wiring on section 4.

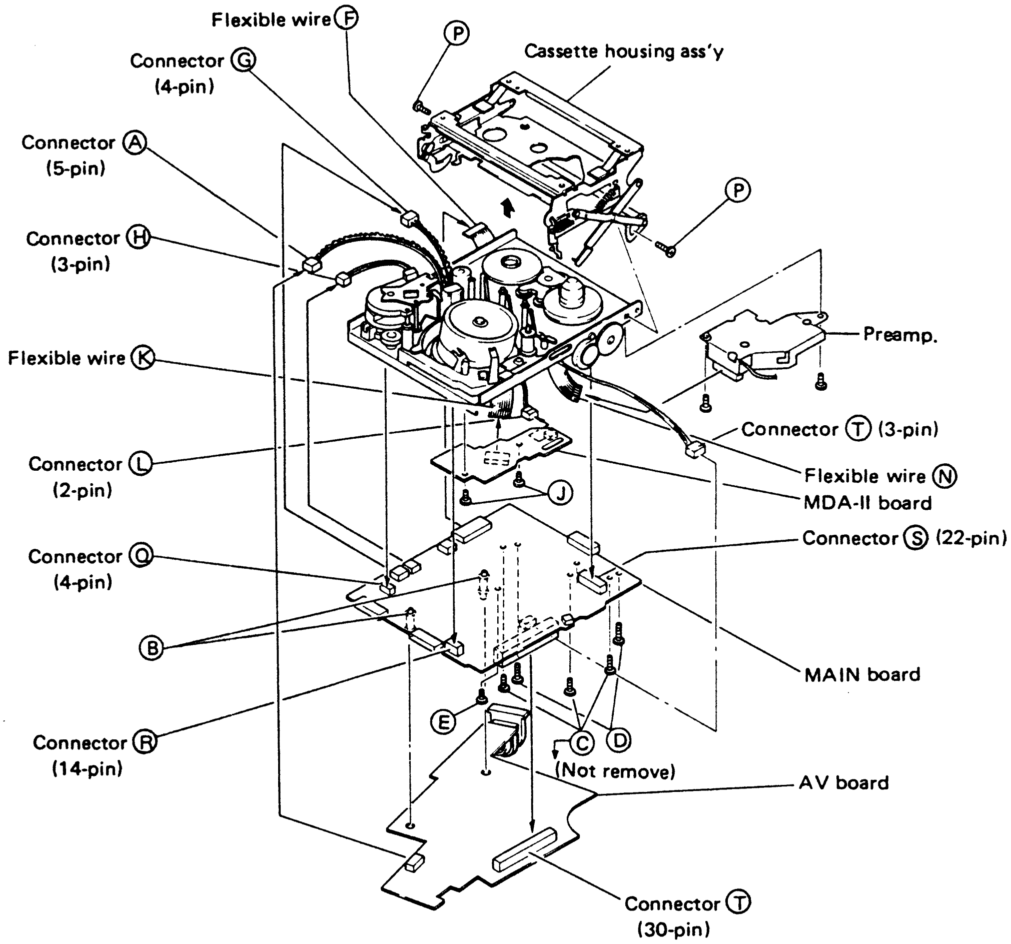
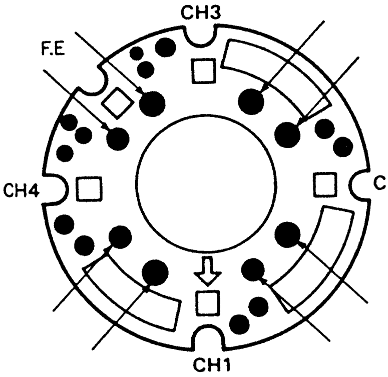

Flexible wire Ⓕ
Ⓟ
Cassette housing ass'y
Connector Ⓖ (4-pin)
Connector Ⓐ (5-pin)
Ⓟ
Connector Ⓗ (3-pin)
Preamp.
Flexible wire Ⓚ
Connector Ⓣ (3-pin)
Flexible wire Ⓝ
Connector Ⓛ (2-pin)
Ⓙ
MDA-II board
Connector Ⓢ (22-pin)
Connector Ⓠ (4-pin)
Ⓑ
MAIN board
Ⓔ
Ⓒ
Ⓓ
Connector Ⓡ (14-pin)
(Not remove)
AV board
Connector Ⓣ (30-pin)

Fig. 1-6-2 Boards removal

1.6.4 Replacement of upper drum

Note: At replacing the upper drum, be careful not to touch the head of a new upper drum as well as not to scratch and damage the drum.

1. Unsolder eight soldered points (indicated by arrow marks in the figure) near the center of the upper drum surface, and remove two screws.


CH3
F.E
CH4
CH2
CH1

(Big arrow mark indicates the position of CH1.)

Fig. 1-6-3 Upper drum removal-1

2. To remove the existing upper drum, set a jig provided with a new upper drum as shown in Fig. 1-6-4.

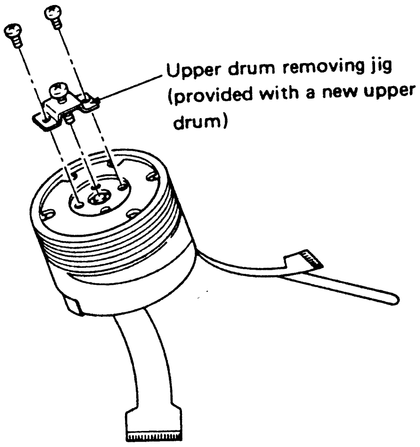

Upper drum removing jig (provided with a new upper drum)

Fig. 1-6-4 Upper drum removal-2

3. Prior to attaching a new upper drum, insert a hot soldering iron (50 W) into the drum's hole for 3 to 5 minutes to expand it by heating.

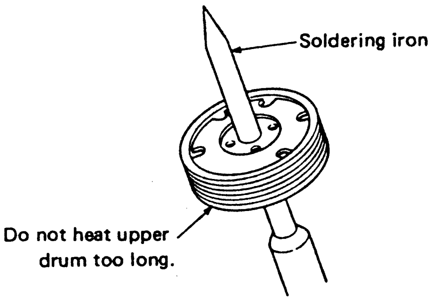

Soldering iron
Do not heat upper drum too long.

Fig. 1-6-5 Upper drum installation-1

4. Correctly set a new upper drum so that the drum's CH2 hole and the lower drum's hole (see Fig. 1-6-6) fit with each other.

Note:

1) Before assembling the upper drum and lower drum, make sure to clean each contact surface with alcohol.
2) The CH1 hole is indicated by an arrow mark on the upper drum board. (in shown in Fig. 1-6-3.)

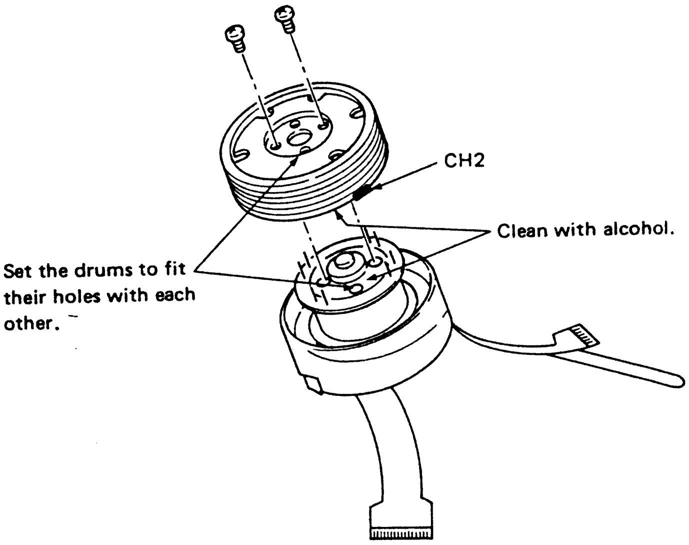

CH2
Clean with alcohol.
Set the drums to fit their holes with each other.

Fig. 1-6-6 Upper drum installation-2

5. For fixing the upper drum, temporarily tighten two screws first, and after the drum has got cold tighten them alternately to secure the drum.
6. After replacement of the upper drum, make sure to check up and adjust the tape transport and electric systems.

1.6.5 Check and adjustment of phase of mechanism

1. Loading rings

1) In the condition that the worm gear (inside the loading motor bracket ass'y) has been removed, turn the take-up and supply loading rings in the Unloading direction.

2) Assemble the take-up loading ring and supply loading ring so that the hole of the supply loading ring and the V-notch of the take-up loading ring are aligned with the triangle mark of the main deck being viewed from the top.

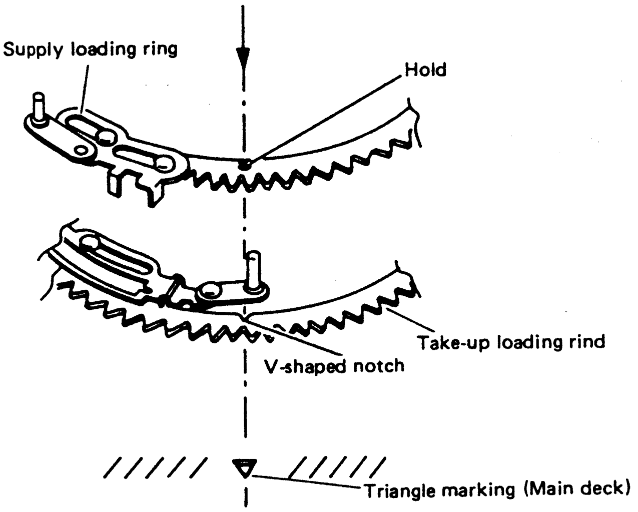

Supply loading ring
Hold
Take-up loading rind
V-shaped notch
Triangle marking (Main deck)

Fig. 1-6-7 Phase of loading ring-1

Note: Regarding correlative position of the pole base ass'y and ▲ mark of the guide rail

- Set the unit into the Stop mode, and move the supply guide roller and take-up guide roller close to each other by fingers (this applies to back-lash adjustment of the rings). At this time, confirm that an edge of the pole base (even if a little part) overlaps on ▲ mark.

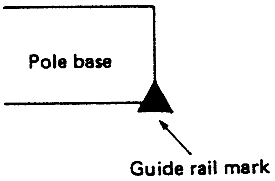

Pole base
Guide rail mark

Fig. 1-6-8 Phase of loading-2

2. Middle pole

1) Move the middle pole in the direction of the arrow Ⓐ.

2) Set the arm gear positioning its shaft Ⓓ aligns with the positioning hole Ⓒ and the middle pole's shaft Ⓔ in a line as shown in the figure.

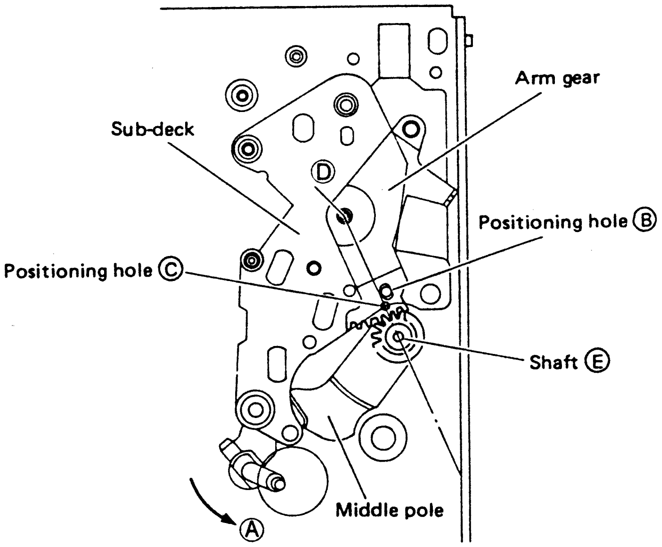

Arm gear
Sub-deck
Ⓓ
Positioning hole Ⓑ
Positioning hole Ⓒ
Shaft Ⓔ
Middle pole
Ⓐ

Fig. 1-6-9 Phase adjustment of middle pole

3. Control cam

Set the control cam (gear) as its marking is positioned in a straight line which connects the centers of its shaft and the terminal gear.

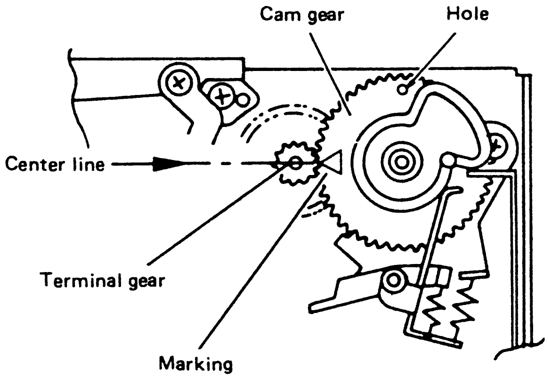

Cam gear
Hole
Center line
Terminal gear
Marking

Fig. 1-6-10 Phase adjustment of control cam

4. Mode control switch

Confirm that, in the Stop mode, the mode control switch has such the positional relation with others.

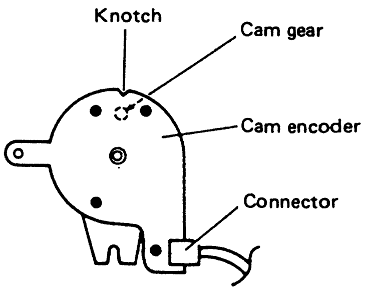

Knotch
Cam gear
Cam encoder
Connector

Fig. 1-6-11 Phase adjustment of mode control switch

1.7 INSPECTION AND MAINTENANCE

Since this model is equipped with rotary parts and consumptive parts which wear away as time passes, it is important to clean the tape transport system and rotary parts as well as to apply oil and grease to them in order to make full use of its real capacity for a long time.

Besides such the simple maintenance work, it needs to replace wearing parts periodically.

1.7.1 Standard servicing schedule for main components

The following table indicates the standard servicing period by kind of servicing such as cleaning, oiling, replacing, etc. In practice, the indicated periods will widely vary according to environmental and using conditions, but it is plain that nonfulfillment of the maintenance work not only shortens the specific period of every item sharply but also influences other components badly.

Also be aware that rubber parts may possibly deform and age as time passes even when the set is not used.

System	Symbol No.	Parts Name	Ass'y	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	3000
Tape Transport system	21	Impedance roller		★	★	★	★	★	★	★	★	★
	18	Supply slant pole	a									
	19	Supply guide roller	a									
	20	Tension pole	a									
	7	Middle pole	a									
	6	Take-up guide pole A	a									
	3	Take-up guide pole B	a									
	9	Take-up guide roller	a									
	10	Take-up slant pole	a									
	8	Capstan	a									
	2	Lower drum	a									
	1	Upper drum	a	★	★	☆	●	★	★	☆	●	●
	4	A/C head	a	★	★	★	★	★	★	★	★	●
	5	Pinch roller	a	★	★	★	★	★	★	★	★	●
Drive system	23	Capstan motor	a								●	
	22	Belt					○				●	○
	24	Mode control motor										●
	12	Take-up clutch gear	a	△	△	△	▲	△	△	△	▲	▲
	15	Supply reel disk	a	△	△	△	▲	△	△	△	▲	▲
	14	Center pulley	a				○				○	○
	13	Search brake lever		★	☆	★	☆	★	☆	★	☆	☆
	11	Take-up brake lever		★	★	★	☆	★	★	★	☆	☆
Others	16	Dumper					○				○	●
	17	Tension band	a				○				○	○
	25	Brush					○				○	○

★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
a : Will be provided as assembly parts for replacement
▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

Table 1-7-1 Maintenance schedule

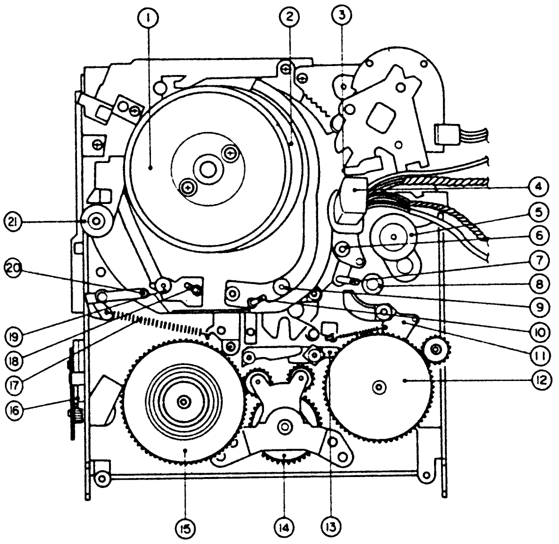


Fig. 1-7-1 Location of main mechanism parts (Top view)

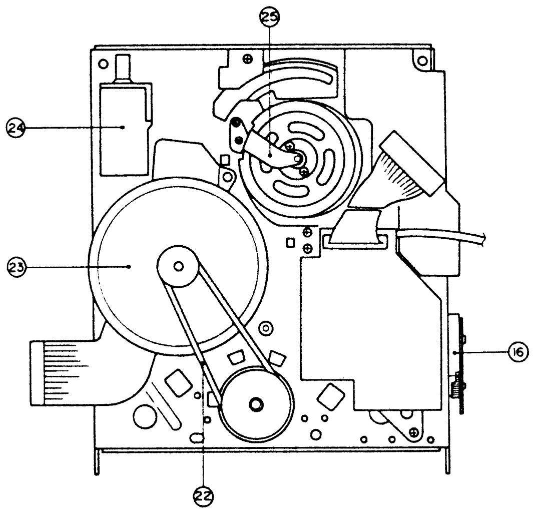


Fig. 1-7-2 Location of main mechanism parts (Bottom view)

1.7.2 Remarks

1. Cleaning

1) For cleaning of the upper drum (particularly video heads) use fine-woven cotton cloth or Kimwipe which alcohol soaks through. Regarding cleaning manner, do not move the cloth but turn the upper drum counterclockwise.

Note: Make sure not to move the cloth in the vertical direction to the video head, since it causes damage of the video heads.

2) For cleaning of parts of the tape transport system except the upper drum, use fine-woven cotton cloth or cotton stick in which alcohol soaks.

3) For cleaning of the search brake lever and take-up brake lever, take off the take-up clutch gear first, and then clean them with cotton stick soaked with alcohol.

4) Before loading the deck with cassette tape, confirm that the cleaned parts are completely dry.

2. Applying oil and grease

1) For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.
Table 1-7-2 specifies oil and grease to be used.

2) When oiling, clean the objective parts first and then apply one or two drop(s) of oil. Too much oiling causes rotary parts to slip because of oil leakage.

Classification	Name	Parts No.	Symbol in drawing
Grease	Moriton Grease No.1	MOS2-C	A
Oil	Cosmo Hydro HV100	YTU94027	B

Table 1-7-2 Specific oil and grease to be used

3. Checkup

After replacement of the supply reel disk and tension band, make sure to inspect and adjust back tension according to the adjustment procedure of the deck section.

4. Replacement

For replacement parts which are supplied as assembly parts, they are indicated by "a" in the "Ass'y" column of the Table 1-7-1.

For their parts numbers, refer to the parts list of the mechanism assembly parts.

SECTION 2

DECK SECTION ADJUSTMENT

2.1 PREPARATIONS

2.1.1 Precautions

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test equipments must be done, and then commerce necessary repair, replacement, and adjustment, etc.

At first, pay attention to the following points.

1. When inserting a VHS-C cassette, the cassette door must be removed beforehand since it comes in contact with the drum.
2. When observing chip TP, use an IC clip so that there is no tension.
3. Depending on the volume resistance, a 0.35 mm non-magnetic bit flat screwdriver will be necessary. Have one on hand.
4. Since Input signal is from the camera, focus lock mode should be selected.
5. Use two or more lamps for lighting. The color temperature should be 3,200 K and the brightness should be 4,000 Lux or more.
6. Make sure that there is no dirt on the test pattern or camera lens.
7. Adjust in an area where external light will not affect results.
8. Remove the MAIN board from the mechanism-chassis. Attach the patchcord and operate, paying attention to the following items.
   1) The screw (with attached washer) in the center of the MAIN board is the screw for taking GND from the mechanism-chassis. If the screw has been removed, take GND to the chassis from the solder section on the screw hole.
   2) Turn pins 4 and 5 on the MAIN board CN12 to GND.
   3) Turn the leaf switch on the MAIN board to ON.
   4) The end sensor will now stop operating. Be careful of the end section of the tape and the beginning section of the tape during rewind.

2.1.2 Hooking up

Remove by referring to section 1.5 "Disassembly of camera section" and connect as shown in Fig. 2-1-1.

During adjustment of the mechanism this does not operate as a single deck unit. Operate it with the camera section connected since a power from the camera section is required.

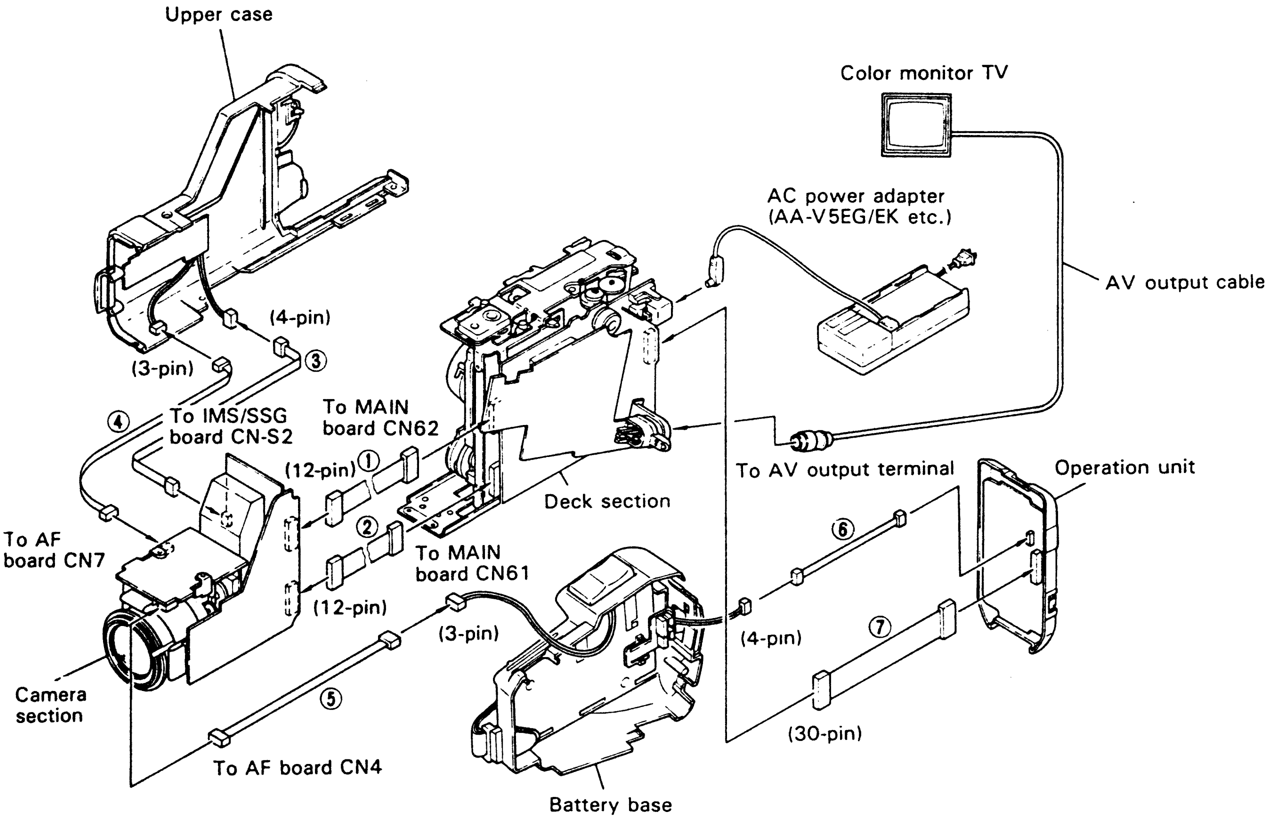
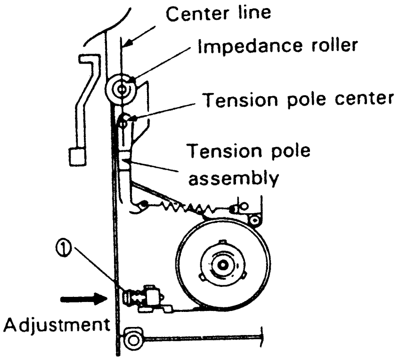
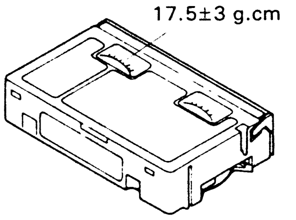
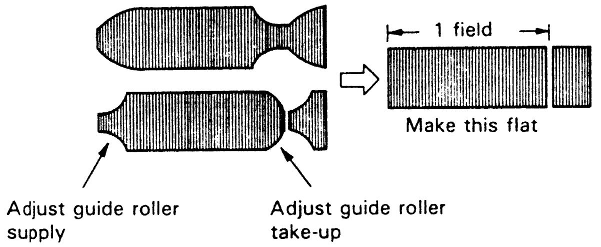
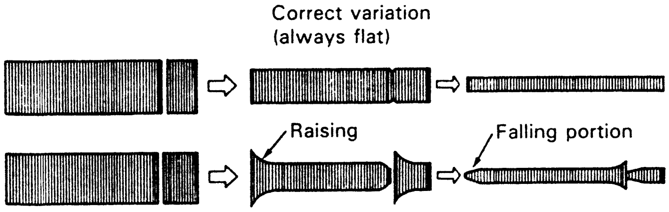
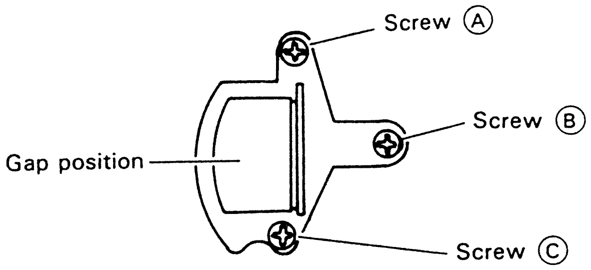

Upper case
Color monitor TV
AC power adapter
(AA-V5EG/EK etc.)
AV output cable
(4-pin)
(3-pin)
③
④
To IMS/SSG
board CN-S2
To MAIN
board CN62
(12-pin)①
To AV output terminal
Operation unit
Deck section
To AF
board CN7
②
To MAIN
board CN61
⑥
(12-pin)
(3-pin)
(4-pin)
⑦
Camera
section
⑤
(30-pin)
To AF board CN4
Battery base

Fig. 2-1-1 Hooking up for deck section adjustment

2.2 SERVO & INTERCHANGEABILITY

After changing the whole drum ass'y/the upper drum or the A/C Head, the following adjustments must be performed.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Back tension	•Cassette torque meter •REC	•Cassette torque meter	•Screw ①	1) Use the cassette torque meter and set for REC mode. Adjust screw ① for 17.5±3 g.cm. 2) Set for REC mode at the beginning of the self-recording tape. Confirm the tension pole and the impedance roller shaft are in a straight line to the front of the deck. **Note:** Confirm that the tension pole does not contact the shassis at the tape beginning and the impedance roller rotates at the tape end. **Note:** If necessary, replace the tension band. Severe variation of tension value may necessiate replacing the supply reel disk.
	 Center line Impedance roller Tension pole center Tension pole assembly ① Adjustment **Fig. 2-2-1** Tension pole position	 **Fig. 2-2-2** Cassette torque meter			
2	Tape pattern	•MH-C2 stairstep	•TP109 (TP FM) •TP111 (DRUM FF) for trigger 0 1 MAIN	•Supply/take-up Guide rollers	1) Connect the oscilloscope to TP109. Trigger the oscilloscope externally with TP111 and set for the trigger slope to minus (−). 2) Play stairstep portion of the alignment tape MH-C2. 3) Adjust the Tracking CTL for maximum FM output level. While observing the FM waveform, turn the supply on take-up guide roller to get a flat waveform by 1.5 m/m hexagonal wrench. **Note:** To avoid damaging the tape, turn the guide rollers slowly. 4) While varying the Tracking CTL for maximum to minimum FM level, confirm FM waveform is always flat. If there is falling or raising portions, stop turning the Tracking CTL and perform fine adjustment of supply or take-up guide roller height so that waveform is as flat as possible. Repeat step (4) several times. 5) Set for stop mode and then for playback mode again, since the height of guide rollers may be move during adjustment. Confirm, when varying the Tracking CTL, FM waveform variation is always flat. 6) Use a self-recording tape and perform recording and playback. Confirm FM waveform variation is flat when varying the Tracking CTL. 7) During the above adjustment, confirm that there is no wrinkles or bend of the tape at the impedance roller or take-up guide pole when performing loading/unloading, search rewind or play mode from search rewind. If necessary, adjust height of the impedance roller or angle of the A/C head (refer to next).
	 1 field Make this flat Adjust guide roller supply Adjust guide roller take-up **Fig. 2-2-3** Tape pattern adjustment-1  Correct variation (always flat) Raising Falling portion **Fig. 2-2-4** Tape pattern adjustment-2				
		•REC then PB •SP & EP			

<table>
<tr><th>No.</th><th>Item</th><th>Signal & Mode</th><th>Check Point</th><th>Adjustment Parts</th><th>Description</th></tr>
<tr><td rowspan="2">3</td><td>Audio/ control head Height & Azimuth</td><td>•MH-C2
7 kHz
(stairstep)</td><td>•AVCN pin 6
(AUDIO OUT)
[0][2] A/V</td><td>•Audio/control head</td><td rowspan="2">1) Connect the oscilloscope to AVCN pin 6 and play audio 7 kHz (stairstep) portion of MH-C2, and measure the audio output level.
Note: If the output level is around −6 dB (1.1 Vp-p), adjustment is not necessary.
Note: Screw Ⓐ is not for adjustment purposes. Never turn screw Ⓐ.
This model does not have a full erase head. The signals are erased by the flying erase, audio erase and control erase heads. For this reason, if the height of the A/C head is not correct, it can lead to erasing of the video signal and not to erasing the former control signal and thus to faulty operation during playback (particularly playback with another set). For this reason, screw Ⓐ has been adjusted to a standard height that includes service parts.
2) Turn screws Ⓑ and Ⓒ in succession by small and equal increments at a time and adjust for maximum audio output level at A/V cable output. With reference screws screw Ⓐ, adjust azimuth with screw Ⓒ and screw Ⓑ so that small tape wrinkles are not produced at the take-up guide pole, but at the same time, audio output becomes maximum and level fluctuations minimum.</td></tr>
<tr><td colspan="4">
Fig. 2-2-5 A/C head azimuth

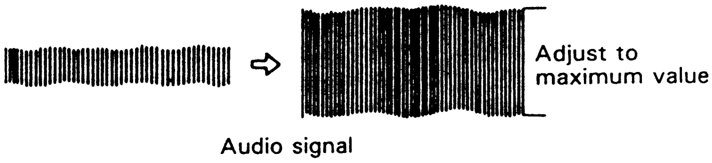



Fig. 2-2-6 Audio output</td></tr>
<tr><td rowspan="2">4</td><td>Control head phase (x value)</td><td>•MH-C2
stairstep
•Tracking CTL
center</td><td>•TP109
(TP FM)
•TP111
(DRUM FF)
for trigger
[0][1] MAIN</td><td>•Control head</td><td rowspan="2">1) Connect the oscilloscope to the TP109 and TP101 which is for external trigger, and set the trigger slop to plus (+).
2) Play stairstep portion of the MH-C2.
3) While turning the Tracking CTL, confirm the following matter.
When the Tracking CTL is center click position, FM level should be maximum.
When turning it to the left or right within about 10°, FM level maintain maximum, and when turning more than 10°, FM level starts to fall.
4) If item 3) is not satisfied, the adjustment must be performed.
Slightly loosen screws Ⓓ and Ⓔ and set the tip of the A/C head positioning tool in the groove and guide hole respectively.
At first, put the A/C head fully in the direction of the capstan and then, gradually turn the tool clockwise and find out the point "c".
5) Fasten screw Ⓓ and Ⓔ. Confirm step 3).
6) If possible, perform recording. Play that tape in the 4 head deck VCR and make sure that interchangeability is normal.

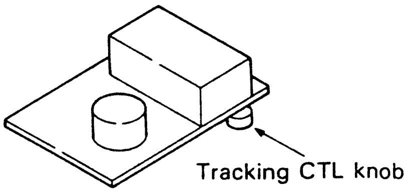
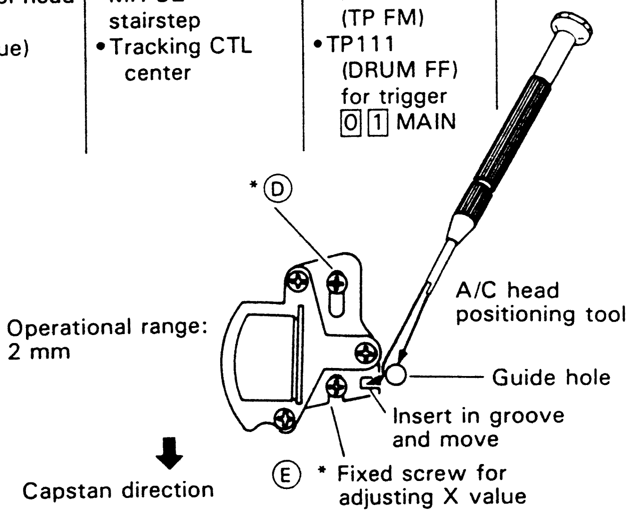



Fig. 2-2-9 Tracking CTL</td></tr>
<tr><td colspan="4">

*Ⓓ
A/C head positioning tool
Operational range: 2 mm
Guide hole
Insert in groove and move
Capstan direction
Ⓔ * Fixed screw for adjusting X value

Fig. 2-2-7 CTL head phase

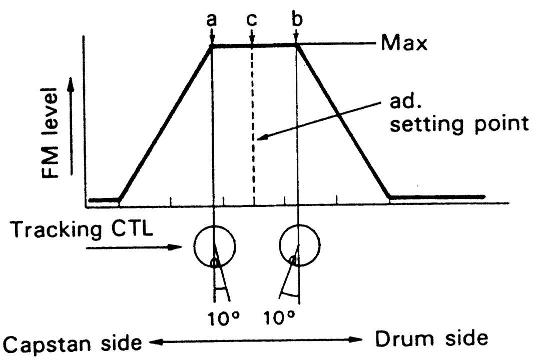



Fig. 2-2-8 CTL head phase setting point</td></tr>
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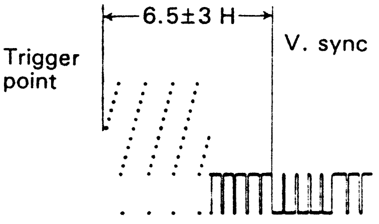
<table>
<tr><th>No.</th><th>Item</th><th>Signal & Mode</th><th>Check Point</th><th>Adjustment Parts</th><th>Description</th></tr>
<tr><td rowspan="2">5</td><td>PB switching point</td><td>•MH-C2 stairstep
•Tracking CTL center</td><td>•TP101 (VIDEO OUT) 02 A/V
•TP111 (DRUM FF) for trigger 01 MAIN</td><td>•R108 (PB SW POINT) 01 MAIN</td><td rowspan="2">1) Connect the oscilloscope to TP101 and TP111 which to for external trigger.
2) Play stairstep portion of MH-C1 and adjust the Tracking CTL to the click position.
3) Adjust R108 so that the trigger point becomes 6.5 H before V. Sync.</td></tr>
<tr><td colspan="4">

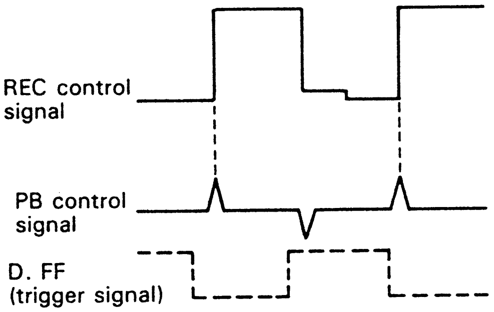
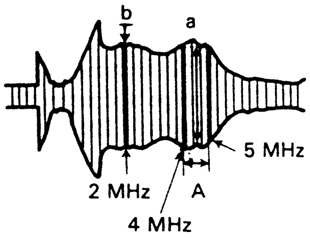
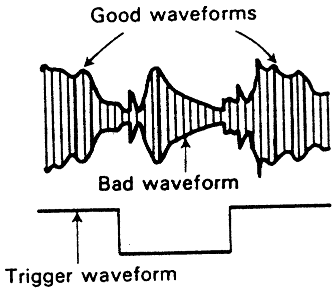
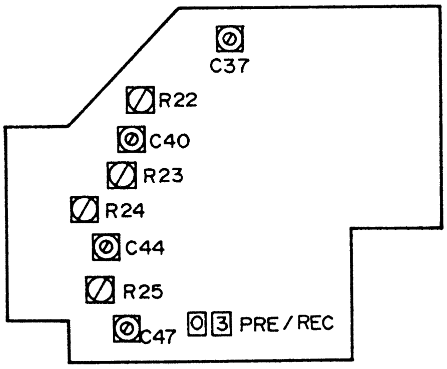
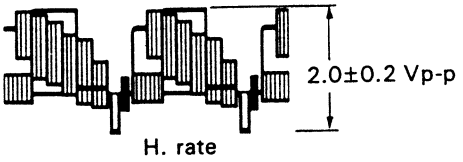
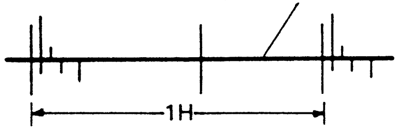
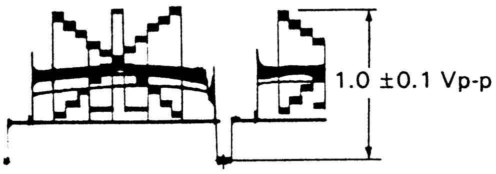
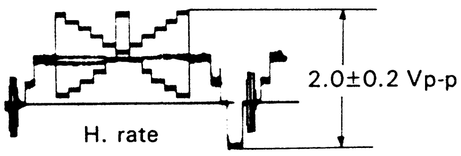
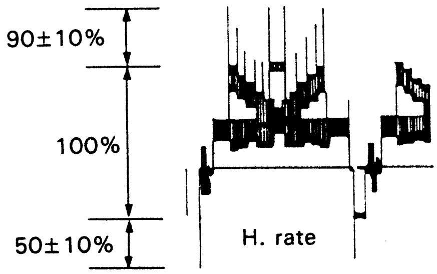
Fig. 2-2-10 PB switching point</td></tr>
<tr><td rowspan="2">6</td><td>Tracking preset</td><td>•REC then PB
•Tracking CTL center</td><td>•TP108 (CTL OUT)
•TP111 (DRUM FF) for trigger 01 MAIN</td><td>•R103 (TRACKING PRESET) 01 MAIN</td><td rowspan="2">1) Connect the oscilloscope to TP108 and TP111 which is for external trigger.
2) Use the self recording tape and perform recording.
During recording, make a note the phase of TP108 raising point.
3) Set the Tracking CTL to the click position and play the portion recorded in the step 2).
Adjust R103 so that the raising pulse of PB control signal coincides with the phase of noted recording control signal.</td></tr>
<tr><td colspan="4">

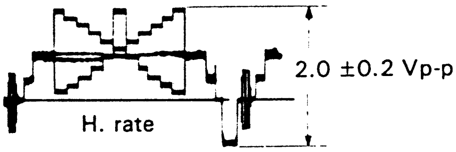
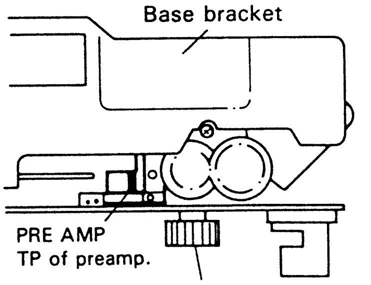
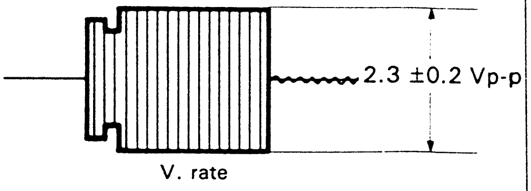
Fig. 2-2-11 Tracking preset</td></tr>
<tr><td rowspan="3">7</td><td colspan="5">**Note:** Make this adjustment only when inversion and flicker are extreme while playing back the MH-C2 color bars after replacing the upper drum.</td></tr>
<tr><td>Video Head Resonance /Fo</td><td>•MH-C2 RF sweep</td><td>•Q109 base (RF signal) 02 A/V</td><td>•Separate chart</td><td rowspan="2">1) Play RF sweep portion of MH-C2.
2) Connect the oscilloscope to the Q109 base on the A/V board and a trigger.
Note: Waveforms can be obtained from all channels by applying the triggers shown in the chart to the left.
3) Rotate the tracking knob and set the FM output to maximum.</td></tr>
<tr><td colspan="4"><table>
<tr><th></th><th>Trigger (–)</th><th>Adjustment (R)</th><th>Adjustment (C)</th></tr>
<tr><td>CH-1</td><td>CN31, pin 19</td><td>R24</td><td>C44</td></tr>
<tr><td>CH-2</td><td>CN31, pin 17</td><td>R22</td><td>C37</td></tr>
<tr><td>CH-3</td><td>CN31, pin 20</td><td>R25</td><td>C47</td></tr>
<tr><td>CH-4</td><td>CN31, pin 18</td><td>R23</td><td>C40</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Signal & Mode</th><th>Check Point</th><th>Adjustment Parts</th><th>Description</th></tr>
<tr><td></td><td colspan="4">
b
a
5 MHz
2 MHz
A
4 MHz
Fig. 2-2-12 PB FM

Good waveforms
Bad waveform
Trigger waveform
Fig. 2-2-13 PB FM (Trigger waveform)

C37
R22
C40
R23
R24
C44
R25
C47
0 3 PRE/REC
Fig. 2-2-14 PRE/REC board VR layout chart</td><td>4) Confirm that the waveforms of all channels are as shown in Figure 2-2-12.
5) If the 4 ~ 5 MHz marker FM output level shown in Figure 2-2-13 is low, adjust the R of that channel and set the level to maximum.
6) Measure the 2 MHz and 5 MHz retios (a/b) of all channels. Select the channel with the best value and adjust the R of all other channels to this same value.
7) Next, when there is no peak during A, adjust the C of that channel so that there is a peak during A.
8) After adjustment, confirm that there is no inversion or flicker during MH-C2 color bar playback and self-recording and playback.</td></tr>
</table>

2.3 Y (LUMINANCE) CIRCUIT

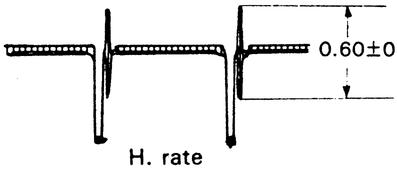
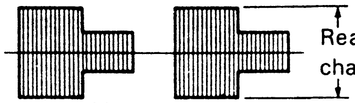
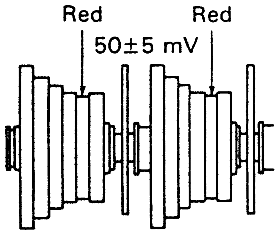
<table>
<tr><th>No.</th><th>Item</th><th>Signal & Mode</th><th>Check Point</th><th>Adjustment Parts</th><th>Description</th></tr>
<tr><td>1</td><td>PB Y level</td><td>•MH-C2 color bar</td><td>•TP101 (VIDEO OUT) 0 2 A/V</td><td>•R133 (PB Y LEVEL) 0 2 A/V</td><td rowspan="2">1) Play color bar portion of MH-C2.
2) Adjust R133 for 2.0 Vp-p at TP101</td></tr>
<tr><td></td><td colspan="4">
2.0±0.2 Vp-p
H. rate
Fig. 2-3-1 PB Y level</td></tr>
</table>

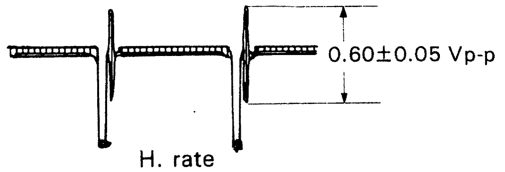
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
2	YNR input level	•MH-C2 color bar  H. rate **Fig. 2-3-2** YNR edge noise	•TP105 (PB 1H DL Y) •TP106 (PB Y OUT) $\boxed{0}\boxed{2}$ A/V •TP111 (DRUM FF) for trigger $\boxed{0}\boxed{1}$ MAIN	•R199 (PB 1H DL Y LEVEL) $\boxed{0}\boxed{2}$ A/V	1) Play MH-C2 color bar portion. 2) Connect one channel of dual trace oscilloscope to TP106 and other channel to TP105. Change CH-2 to reverse (INV) mode and align both channel's BOLTs/DIV. SW to the same range and select Vertical mode SW to ADD. 3) Adjust R199 for minimum level in order to adjust to the same level.
3	E-E Y level	•E-E •Gray scale  H. rate **Fig. 2-3-3** E-E input level	•CN-V2 pin 10 (Y OUT) $\boxed{2}\boxed{2}$ VIDEO		1) Pick up the gray scale pattern. 2) Confirm that the input level to the deck is 1.0 Vp-p at CN-V2 pin 10 on the VIDEO board. If necessary, adjust the zoom button so that the white portion of the pattern is 1.0 Vp-p.
		 **Fig. 2-3-4** E-E output level	•TP101 (VIDEO OUT) $\boxed{0}\boxed{2}$ A/V	•R200 (EE Y LEVEL) $\boxed{0}\boxed{2}$ A/V	3) Adjust R200 for 2.0 Vp-p at TP101.
4	White/dark Clip level	•E-E •Gray scale  **Fig. 2-3-5** White/dark clip level	•TP103 (PRE EMPH OUT) $\boxed{0}\boxed{2}$ A/V	•R114 (WHITE CLIP) •R117 (DARK CLIP) $\boxed{0}\boxed{2}$ A/V	1) Pick up the gray scale pattern. 2) Confirm that the input level to the deck is 1.0 Vp-p at CN-V2 pin 10 on the VIDEO board. If necessary, adjust the zoom button so that the white portion of the pattern is 1.0 Vp-p. 3) Adjust R114 and R117 at TP103 so that white clip level becomes 90% and dark clip level becomes 50% respectively.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
5	Carrier & deviation	•E-E •Gray scale	•CN-V2 pin 10 (Y OUT) 2 2 VIDEO		**Note:** This adjustment should be performed only, when E-E and playback of pre-recorded tape are normal, while the sync at self-recording is distorted (poor carrier set) or S/N is extremely poor. (poor deviation).
		 **Fig. 2-3-6** EE/PB Y level			
		•E-E •Short pin 10 of CN-V2 2 2 VIDEO board to GND	•TP104 (REC FM) 0 2 A/V	•R113 (CARRIER) 0 2 A/V	1) Short CN-V2 pin 10 on the VIDEO board and GND with shorting wire. 2) Connect frequency counter to TP104 and adjust R113 for 3.8 MHz±100 kHz. 3) Confirm that the input level to the deck is 1.0 Vp-p at CN-V2 pin 10 on the VIDEO board. If necessary, adjust the zoom button so that the white portion of the pattern is 1.0 Vp-p.
		•REC then PB •Gray scale	•TP101 (VIDEO OUT) 0 2 A/V	•R112 (DEVIATION) 0 2 A/V	4) Record and then play the same portion. Confirm that TP101 output level is 2.0 Vp-p (±0.2 Vp-p). 5) If it is out of the above specification, adjust R112 during recording and repeat above step 4).
6	REC FM level	•Lens cap •REC	•TP of PREAMP (CH-A REC FM OUT) •TP101 (MODE 1) for trigger 0 1 MAIN	•R118 (REC FM LEVEL) 0 2 A/V	1) With the lens capped, set for recording mode. 2) Connect the oscilloscope to TP of PREAMP and TP101 which is for external trigger, and set for the trigger slope to minus (−) 3) Adjust R118 for 2.3 Vp-p.
		 **Fig. 2-3-7** Test point of Rec FM			 **Fig. 2-3-8** CH-A Rec FM level

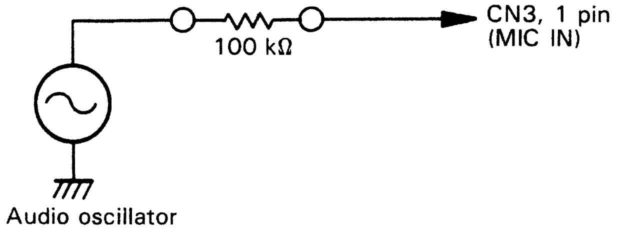
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
7	PB RF equalizer	•REC then PB	•TP101 (VIDEO OUT) $\boxed{0}\boxed{2}$ A/V	•R146 (PB RF EQ) $\boxed{0}\boxed{2}$ A/V	**Note:** This adjustment should be performed only when playback picture has B/W reversal. 1) Record a high contrast object and then play the same portion. 2) While observing the playback picture, adjust R146 so that there is no B/W reversal and picture becomes as sharp as possible.

2.4 COLOR CIRCUIT

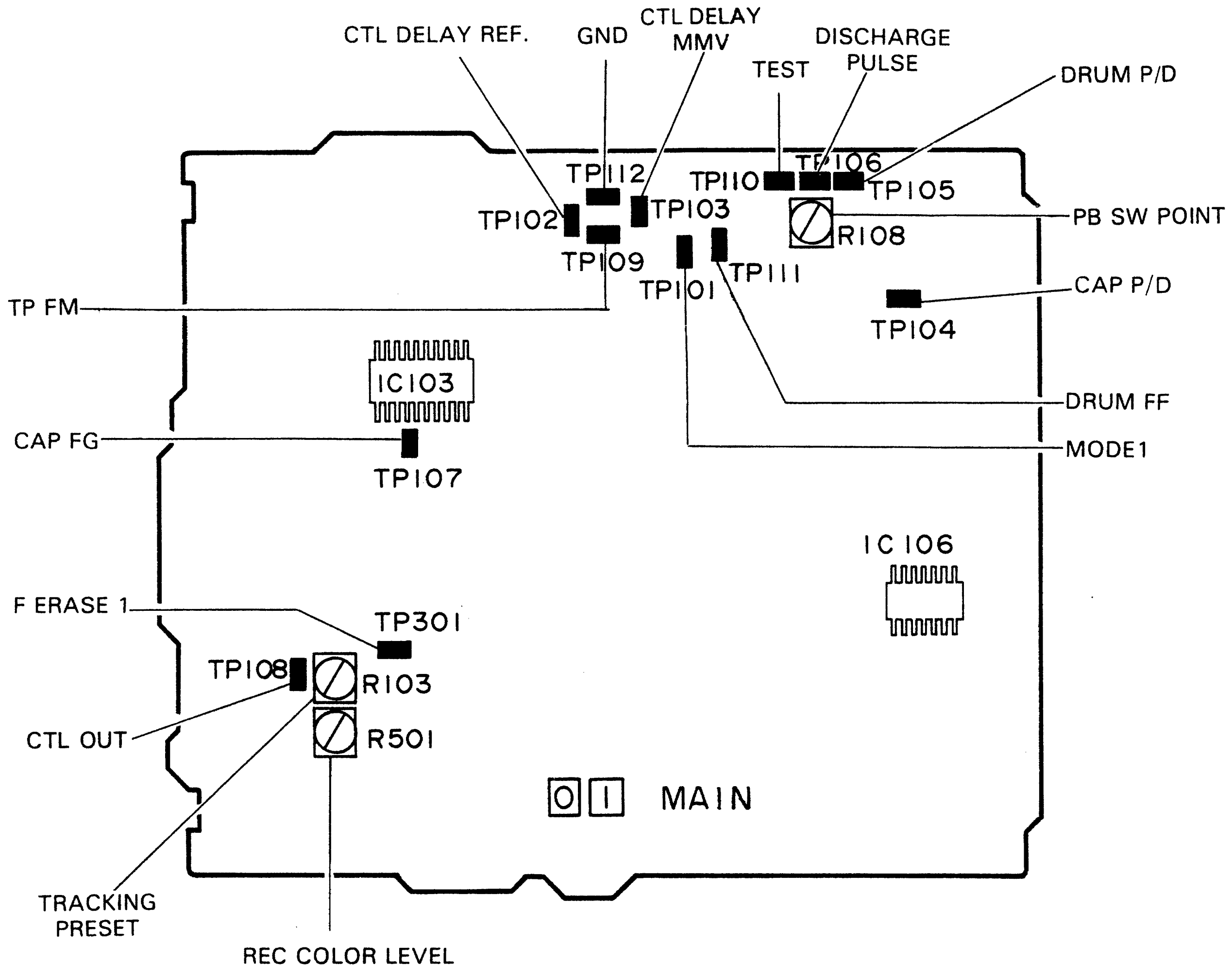
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	E-E burst level	•E-E •Lens cap	•TP101 (VIDEO OUT) $\boxed{0}\boxed{2}$ A/V	•R165 (EE BURST LEVEL) $\boxed{0}\boxed{2}$ A/V	1) With the lens capped, set for E-E mode. 2) Adjust R165 so that the burst level becomes 0.60 Vp-p at TP101.
		 **Fig. 2-4-1** E-E burst level			
2	REC color level	•MH-C2 color bar	•TP108 (PB COLOR ACC IN) $\boxed{0}\boxed{2}$ A/V •TP101 (MODE 1) for trigger $\boxed{0}\boxed{1}$ MAIN		1) Connect the oscilloscope TP108 and TP101 which is for external trigger, and set for the trigger slope to plus (+). 2) Play MH-C1 color bar portion. 3) Turn the Tracking CTL for maximum color level at TP108 and make a note the highest color level "A".
		 **Fig. 2-4-2** MH-C1 PB color ACC IN			
		•E-E Color bar	•CN-V2 pin 12 (C OUT) $\boxed{2}\boxed{2}$ VIDEO		4) Pick up the color bar pattern. Confirm that the color input level of the red section to the deck is 50±5 mVp-p at CN-V2 pin 12 on the VIDEO board.
		 **Fig. 2-4-3** Color input red level			5) Record and then play the same portion. 6) Confirm that the highest channel level becomes 100% ± 10% of the noted level "A".
		•REC then PB •Color bar	•TP108 (PB COLOR ACC IN) $\boxed{0}\boxed{2}$ A/V	•R501 (REC COLOR LEVEL) $\boxed{0}\boxed{1}$ MAIN	7) If necessary, adjust R501 during recording and confirm the playback level during playback. 8) Confirm that the level difference between 4-channels is within 4 dB.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
3	PB burst level	•REC then PB •SP	•TP101 (VIDEO OUT) 0 2 A/V	•R166 (PB BURST LEVEL) 0 2 A/V	1) With the lens capped, record in the SP mode, and then play the same portion. 2) Adjust R166 so that the burst level becomes 0.60 Vp-p at TP101.
	 **Fig. 2-4-4** PB burst level				

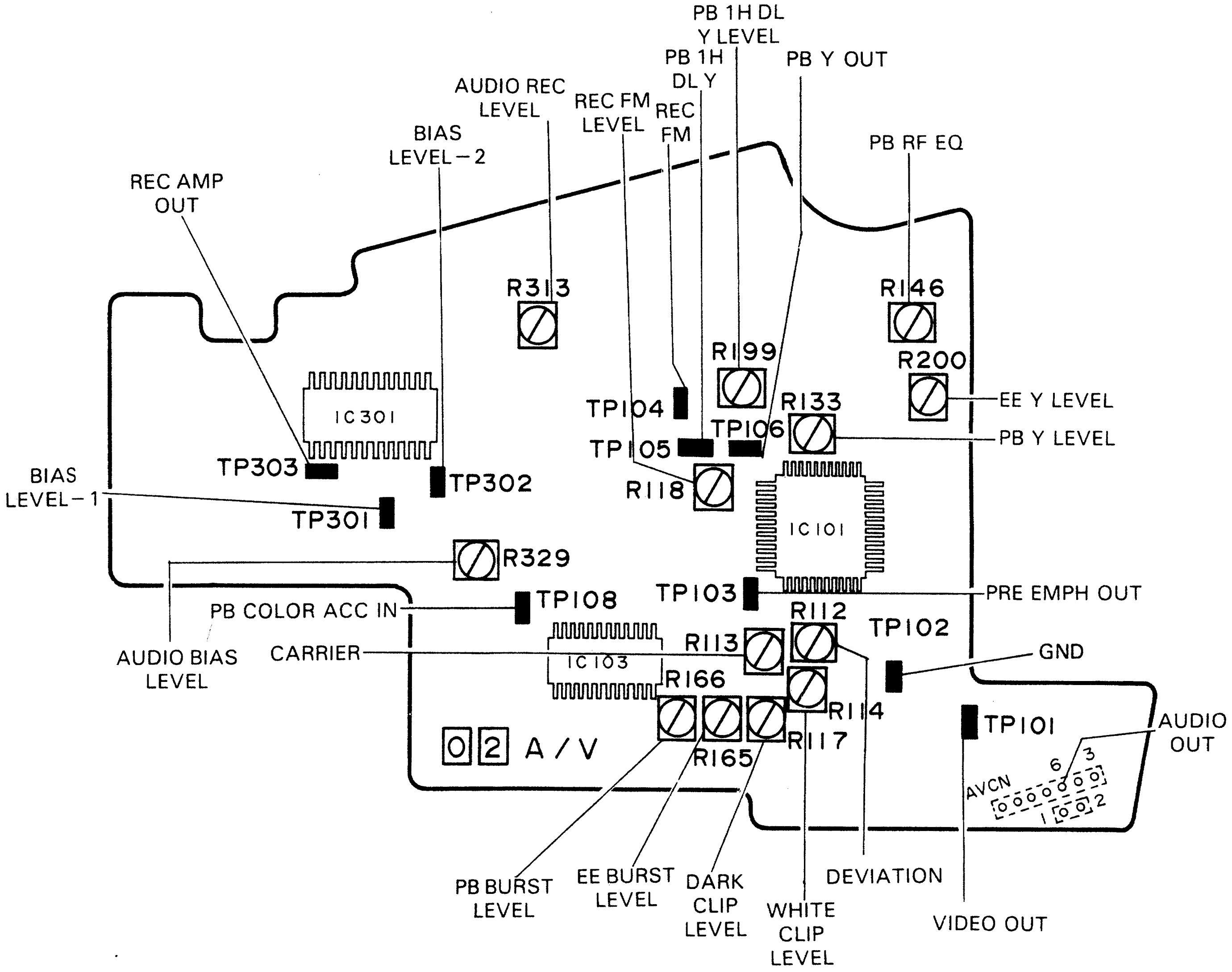
2.5 AUDIO CIRCUIT

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Audio bias level	•REC •No inpuit	•TP301 (BIAS LEVEL-1) •TP302 (BIAS LEVEL-2) 0 2 A/V	•R329 (AUDIO BIAS LEVEL) 0 2 A/V	1) Connect the audio tester to TP301 (HOT) and TP302 (GND). Set for recording mode without Input. 2) Adjust R329 for −51 dBs (6.2 mVp-p, 2.2 mVrms).
2	Audio REC level	•REC then PB •1 kHz/ −35.5 dBs	•AUDIO OUT (A/V cable)	•R313 (AUDIO REC LEVEL) 0 2 A/V	1) As shown in Fig. 2-5-1, supply 1 kHz, −35.5 dBs (36 mVp-p, 13 mVrms) signal to the MIC input connector via 100 kΩ). 2) Record that signal and then play the same portion. 3) Confirm that the playback level is −6 dBs ±1 dBs (1.1 Vp-p, 0.39 Vrms) at audio output terminal from the A/V cable. 4) If necessary, adjust R313 during recording and confirm the playback level during playback.
	 100 kΩ CN3, 1 pin (MIC IN) Audio oscillator **Fig. 2-5-1** Audio Gen. connection				

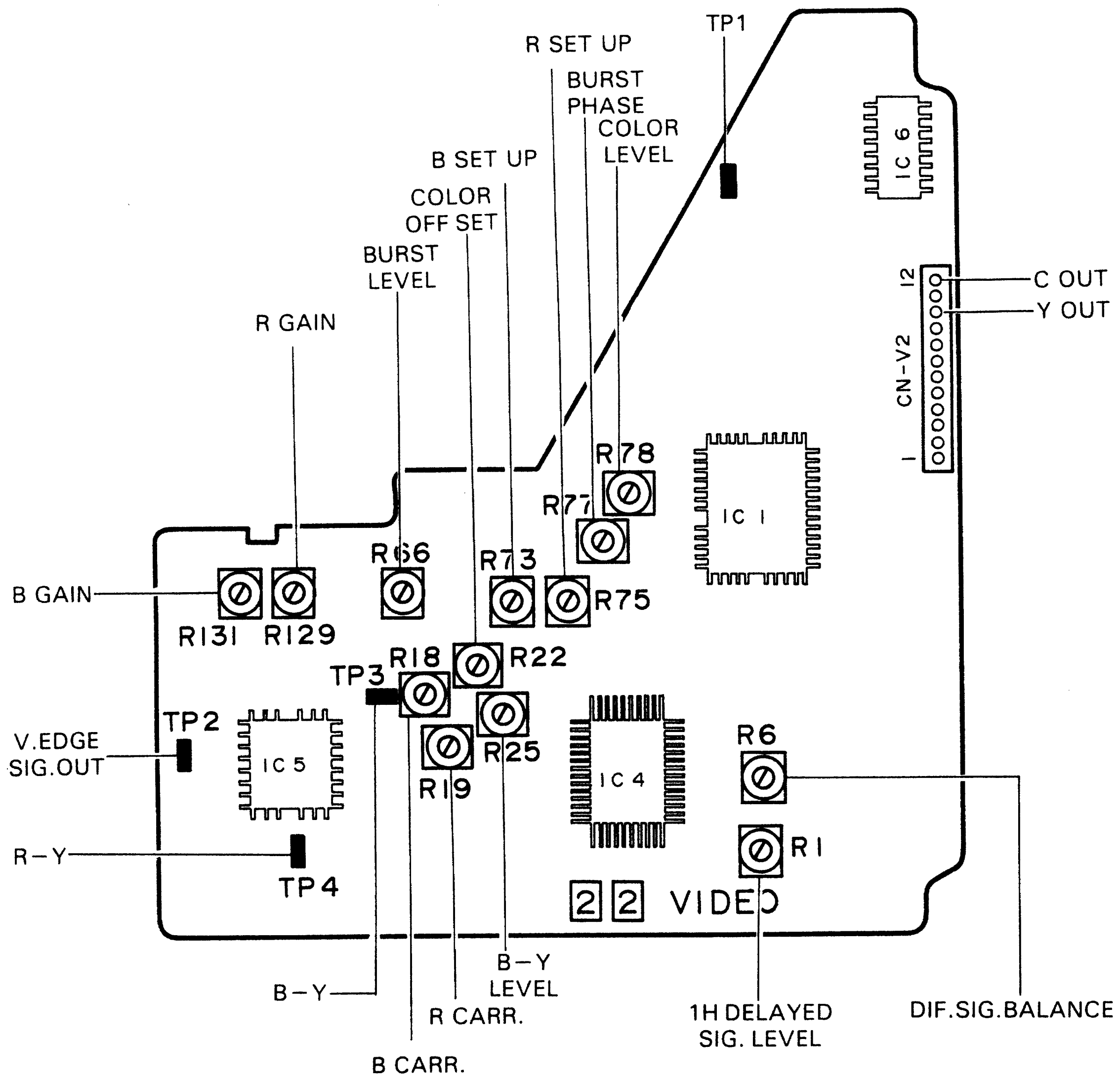
MAIN board TP, VR layout chart


CTL DELAY REF.
GND
CTL DELAY MMV
TEST
DISCHARGE PULSE
DRUM P/D
TP112
TP110
TP106
TP105
TP102
TP103
R108
PB SW POINT
TP109
TP101
TP111
TP FM
CAP P/D
TP104
IC103
DRUM FF
CAP FG
TP107
MODE1
IC 106
F ERASE 1
TP301
TP108
R103
CTL OUT
R501
0 1 MAIN
TRACKING PRESET
REC COLOR LEVEL

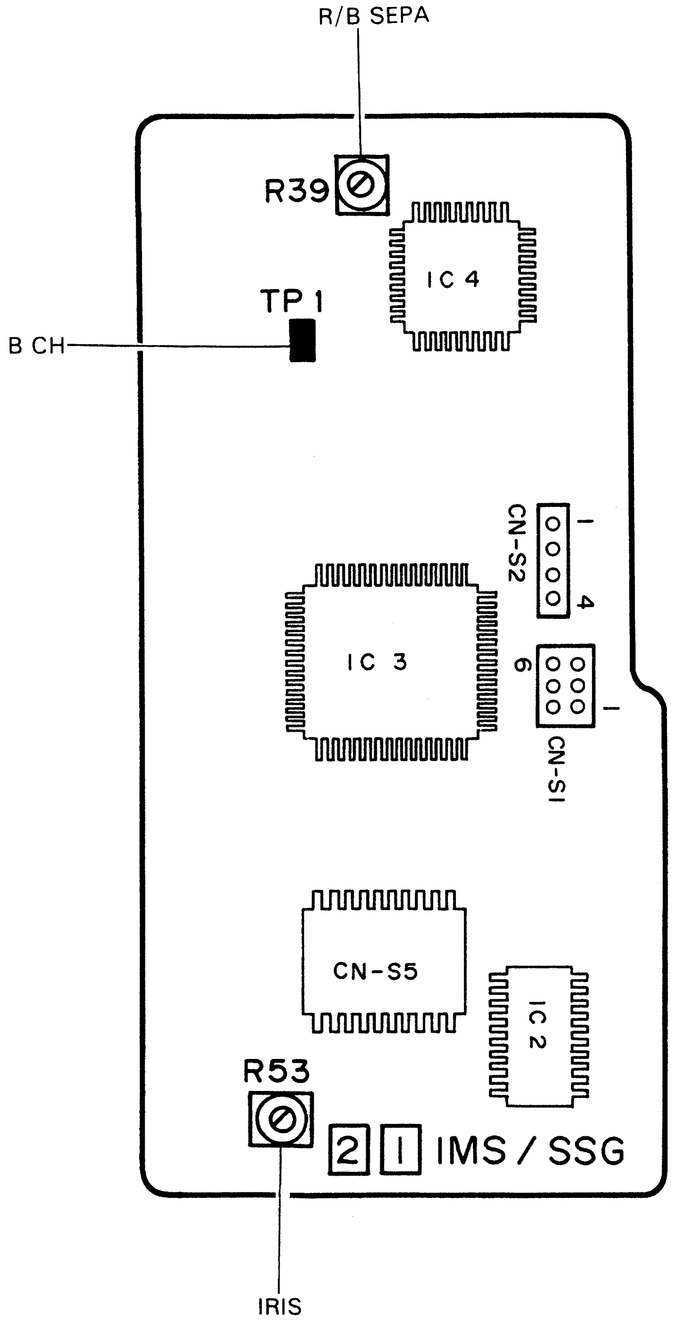
A/V board TP, VR layout chart


PB 1H DL
Y LEVEL
PB 1H
DL Y
PB Y OUT
AUDIO REC
LEVEL
REC FM
LEVEL
REC
FM
BIAS
LEVEL−2
PB RF EQ
REC AMP
OUT
R313
R146
R199
R200
EE Y LEVEL
TP104
R133
PB Y LEVEL
IC301
TP105
TP106
TP303
TP302
R118
BIAS
LEVEL−1
TP301
IC101
R329
TP108
TP103
PRE EMPH OUT
PB COLOR ACC IN
R112
TP102
R113
GND
AUDIO BIAS
LEVEL
CARRIER
IC103
R166
R114
TP101
AUDIO
OUT
02 A/V
R165
R117
AVCN
6
3
1
2
PB BURST
LEVEL
EE BURST
LEVEL
DARK
CLIP
LEVEL
WHITE
CLIP
LEVEL
DEVIATION
VIDEO OUT

VIDEO board TP, VR layout chart


TP1
R SET UP
BURST PHASE
COLOR LEVEL
B SET UP
COLOR OFF SET
BURST LEVEL
R GAIN
IC 6
12
C OUT
Y OUT
CN-V2
1
R78
R77
IC 1
R66
R73
R75
B GAIN
R131
R129
TP3
R18
R22
TP2
IC 5
R25
IC 4
R6
V.EDGE SIG.OUT
R19
R1
R-Y
TP4
2 2 VIDEO
B-Y LEVEL
B-Y
R CARR.
1H DELAYED SIG. LEVEL
DIF.SIG.BALANCE
B CARR.

IMS/SSG board TP, VR layout chart


R/B SEPA
R39
IC 4
TP 1
B CH
CN-S2
1
4
IC 3
6
1
CN-S1
CN-S5
IC 2
R53
2 1 IMS / SSG
IRIS

SECTION 3
CAMERA SECTION ADJUSTMENT

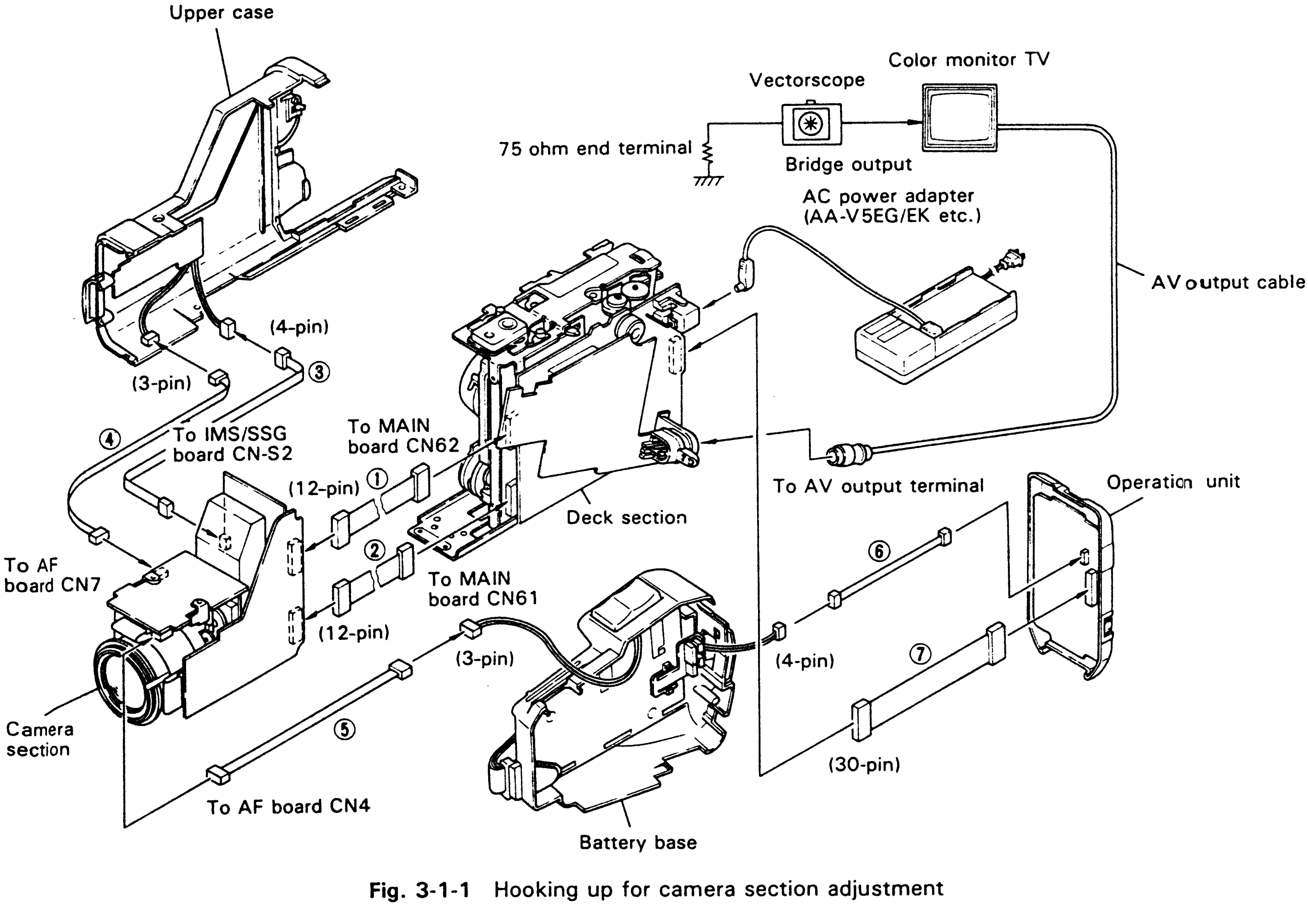
3.1 PRECAUTIONS

3.1.1 Precautions

1) In the event of malfunction with electrical circuit, trouble shooting with the aid of proper test instruments must be done first, and then, commerce necessary repair, replacement, and adjustment.
2) Test pattern illumination:
   Use halogen lamps of "3,200°K" and set them to illuminate the test pattern evently at approximately 4,000 lux with the aid of a lux meter.
   It is recommended to use two or more halogen lamps.
3) Test patterns:
   Use clean "Grayscale" and "Color bar" pattern charts.
4) Test points and Potentiometer:
   They are very small and easy to be destroyed. Therefore, pay enough attention to them not to be shorted and destroyed.
   Use the adjustment tools for adjustment.

3.1.2 Hooking up

When adjusting the camera section, hook it up as shown in Fig. 3-1-1 by using the patch cords and the camera stand.

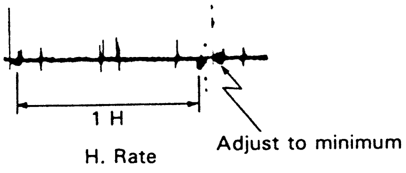
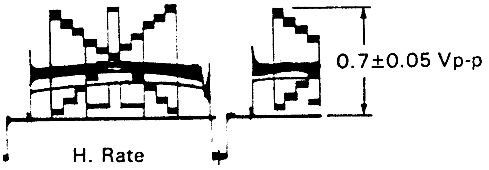
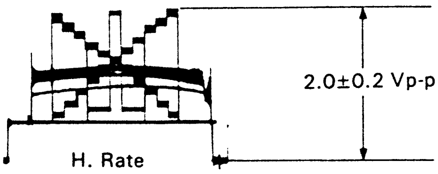


Upper case
Color monitor TV
Vectorscope
75 ohm end terminal
Bridge output
AC power adapter
(AA-V5EG/EK etc.)
AV output cable
(4-pin)
③
(3-pin)
④
To IMS/SSG
board CN-S2
To MAIN
board CN62
(12-pin) ①
To AV output terminal
Operation unit
Deck section
②
To AF
board CN7
To MAIN
board CN61
⑥
(12-pin)
(3-pin)
(4-pin)
⑦
Camera
section
⑤
(30-pin)
To AF board CN4
Battery base

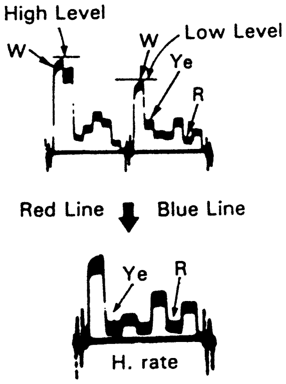
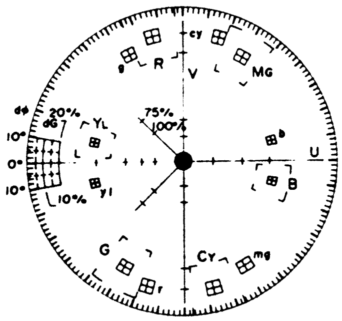
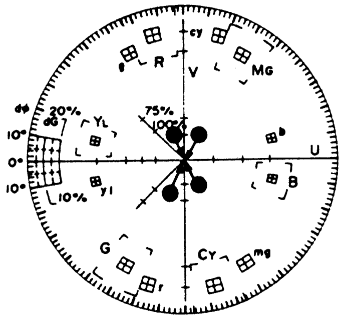
Fig. 3-1-1 Hooking up for camera section adjustment

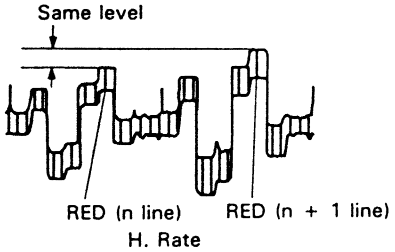
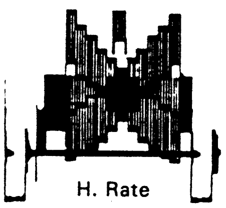
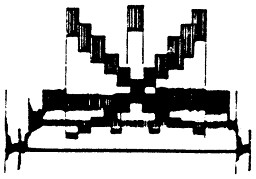
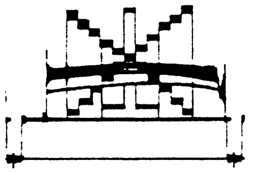
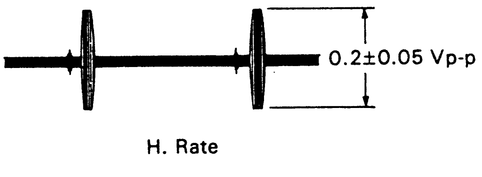
3.2 LUMINANCE (Y) CIRCUIT

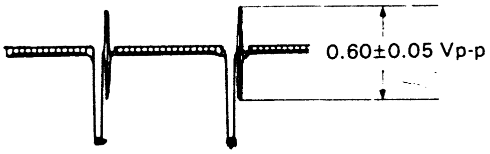
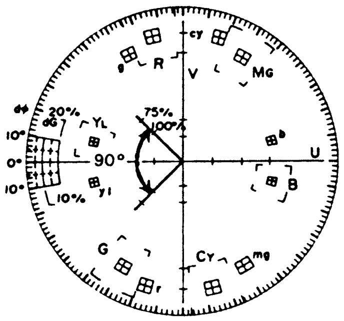
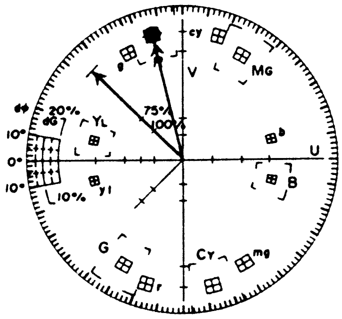
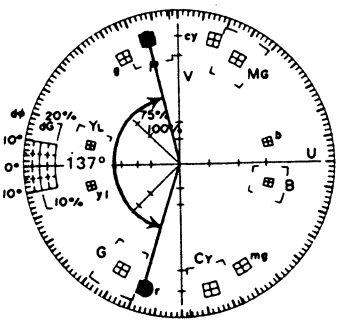
Note: Focus lock mode should be selected.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Vertical enhancer balance  **Fig. 3-2-1** Vertical edge waveform	•Gray scale	•TP2 (V. EDGE SIGNAL OUT) 2 2 VIDEO	•R1 (1H DELAYED SIG LEVEL) 2 2 VIDEO	1) Pick up the center position of the gray scale pattern and observe H-rate waveform at TP2. 2) Adjust R1 so that average noise level becomes minimum.
2	Iris  **Fig. 3-2-2** IRIS adjustment	•Gray scale •Just scan	•CN-V2 pin 10 (Y OUT) 2 2 VIDEO	•R53 (IRIS) 2 1 IMS/SSG	1) Pick up the gray scale pattern with just scan and observe H-rate waveform at pin 10 of CN-V2. 2) Adjust R53 so that picture level becomes 0.7 Vp-p.
3	Deck section E-E Y Level confirmation  **Fig. 3-2-3** Deck E-E level	•Gray scale •Just scan	•TP101 (VIDEO OUT) 0 2 A/V		1) In the same manner as in "IRIS" adjustment, confirm that the E-E Y level via deck section is 2.0±0.2 Vp-p at TP101. 2) If necessary, after IRIS adjustment, perform deck E-E level adjustment as described in section 2.3-4.

3.3 COLOR (C) CIRCUIT

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	R/B separation  High Level W W Low Level Ye R Red Line Blue Line Ye R H. rate **Fig. 3-3-1** R/B separation	•Color Bar •Justscan	•TP1 (B CH) $\boxed{2}\boxed{1}$ IMS/SSG •CN-V2 pin 10 (Y. OUT) for trigger $\boxed{2}\boxed{2}$ VIDEO	•R39 (R/B SEPA) $\boxed{2}\boxed{1}$ IMS/SSG	1) Pick up the color bar pattern with just scan. 2) Connect the oscilloscope to TP1 and pin 10 of CN-V2 on VIDEO board which is for external trigger. 3) Taking notice the blue line, adjust R39 so that yellow level becomes equal to red level. **Note:** The blue line means the scanning line that is the small in signal level of the color for patten's white section.
2	Carrier balance  R cy V MG dφ 20% dG YL 75% 100% 10° 0° 10° U B 10% yl G CY mg **Fig. 3-3-2** Carrier leakage-1	•White pattern	•Vectorscope	•R18 (B. CARR) •R19 (R. CARR) $\boxed{2}\boxed{2}$ VIDEO	1) Pick up the white pattern and short pin 1 of CN-S2 and pin 6 of CN-S1 on the IMS/SSG board with shorting wire in order to open IRIS. 2) Adjust R18 and R19 alternately so that dot is positioned at the center of the vector scope to minimize the carrier leakage.
3	Color offset  R cy V MG dφ 20% dG YL 75% 100% 10° 0° 10° U B 10% yl G CY mg **Fig. 3-3-3** Carrier leakage-2	•Lens cap	•Vectorscope	•R22 (COLOR OFFSET) $\boxed{2}\boxed{2}$ VIDEO	1) With lens capped, adjust R22 so that dot is positioned at the center of the vectorscope to minimize the carrier leakage.

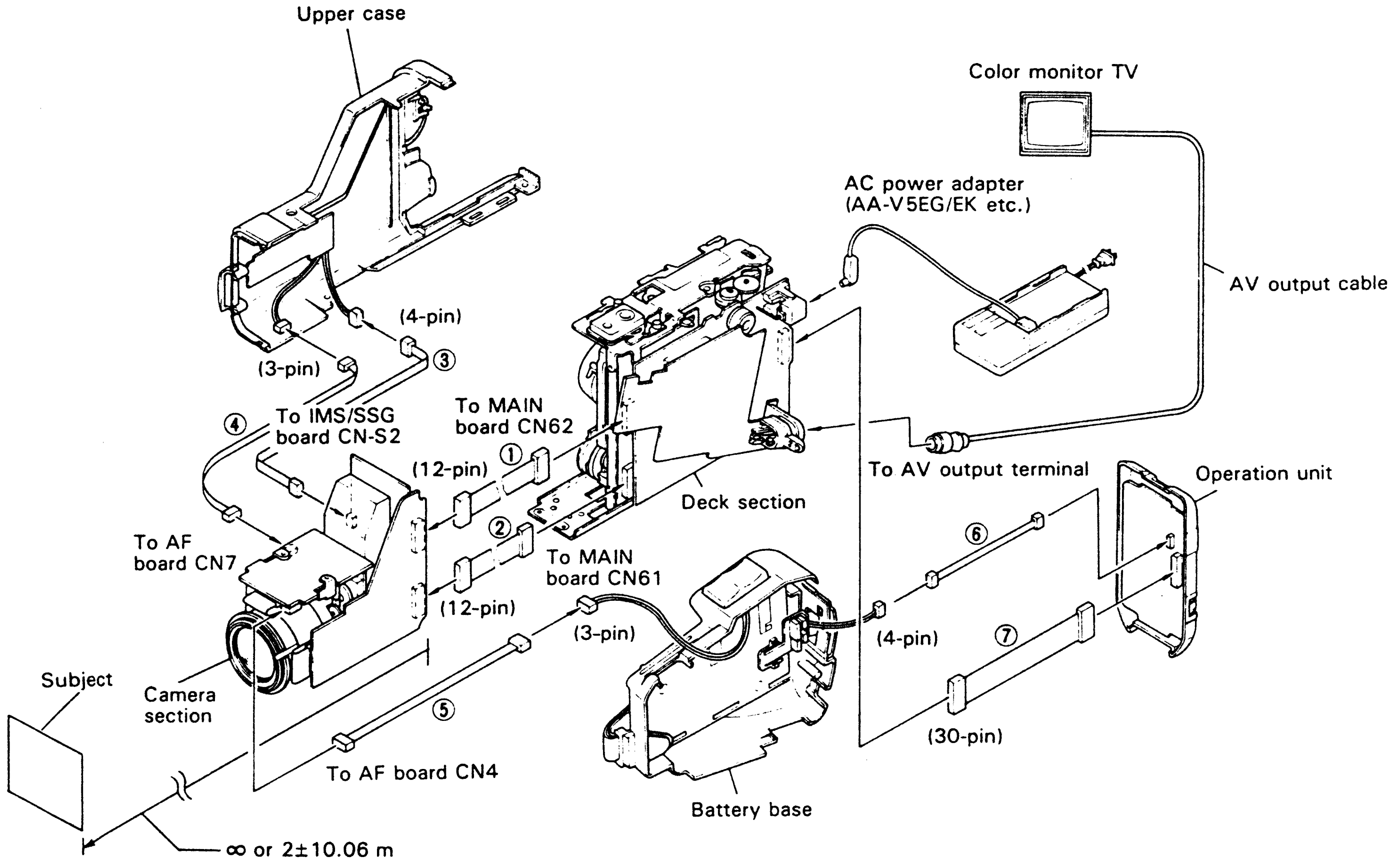
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
4	Color differential signal balance	•Color bar •Just scan  **Fig. 3-3-4** Color differential balance	•TP4 (R-Y out) 2 2 VIDEO	•R6 (DIF, SIG BALANCE) 2 2 VIDEO	1) Pick up the color bar pattern with just scan. 2) Adjust R6 so that R levels between two lines becomes equal.
5	White balance	•Gray scale •Just scan  **Fig. 3-3-5** White bal-1 ↓ (2)  **Fig. 3-3-6** White bal-2 ↓ (3)  **Fig. 3-3-7** White bal-3	•TP101 (VIDEO OUT) 0 2 A/V	•R73 (B SET UP) •R75 (R SET UP) 2 2 VIDEO •R131 (B GAIN) •R129 (R GAIN) 2 2 VIDEO	1) Pick up the gray scale pattern with just scan and observe H-rate waveform at TP101. 2) Adjust R73 and R75 alternately so that carrier leakage of low level becomes minimum. 3) Adjust R131 and R129 altenately so that carrier leakage of white peak level becomes minimum. 4) Repeat steps 2) and 3) several times to minimize carrier leakage all over.
6	Burst level	•Lens cap  **Fig. 3-3-8** Camera burst level	•CN-V2 pin 12 (C. OUT) 2 2 VIDEO	•R66 (BURST LEVEL) 2 2 VIDEO	1) With lens caped, observe H-rate waveform at pin 12 of CN-V2 on the VIDEO board. 2) Adjust R66 so that the burst level becomes 0.2 Vp-p.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
7	Deck section E-E burst level confirmation	•Lens cap  Fig. 3-3-9 Deck EE burst	•TP101 (VIDEO OUT) $\boxed{0}\boxed{2}$ A/V		1) In the same maner as in "Camera Burst level" adjustment, confirm that E-E level via the deck section at TP101 is 0.60 V±0.05 Vp-p. 2) If necessary, after camera burst level adjustment, perform deck EE burst level adjustment as discribed in section 2.4-1.
8	Burst phase	•Color bar •Just scan  cy R V MG 75% 100% 20% dG YL 10° 0° 10° 90° U B 10% yl G Cy mg Fig. 3-3-10 Burst/Red phase	•Vector scope	•R77 (BURST PHASE) $\boxed{2}\boxed{2}$ VIDEO	1) Pick up the color bar pattern with just scan. 2) Adjust R77 so that burst phase difference becames 90°.
9	Color level	•Color bar •Just scan  cy V MG 75% 100% 20% dG YL 10° 0° 10° U B 10% yl G Cy mg Fig. 3-3-11 Burst/Red level ratio	•Vector scope	•R78 (COLOR LEVEL) $\boxed{2}\boxed{2}$ VIDEO	1) Pick up the color bar pattern with just scan. 2) Adjust R78 so that red level becomes 110%±10% of burst level on the vector scope.
10	Color phase	•Color bar  cy V MG 75% 100% 20% dG YL 10° 0° 10° 137° U B 10% yl G Cy mg Fig. 3-3-12 Color phase	•Vector scope	•R25 (B-Y LEVEL) $\boxed{2}\boxed{2}$ VIDEO	1) Pick up the color bar pattern. 2) Adjust R25 so that phase difference between red and green sections of the color bar chart becomes 137°. 3) Pick up the skin tone pattern and confims to obtains the natural color on TV Monitor.

3.4 AUTOFOCUS ADJUSTMENT

3.4.1 Hooking up

Hook up the equipment as shown in Fig. 3-4-1 so that the distance from the subject to the CCD is either infinity (∞) or 2±0.06 m.



Upper case
Color monitor TV
AC power adapter (AA-V5EG/EK etc.)
AV output cable
(4-pin)
③
(3-pin)
④
To IMS/SSG board CN-S2
To MAIN board CN62
(12-pin)
①
To AV output terminal
Operation unit
Deck section
②
To AF board CN7
To MAIN board CN61
⑥
(12-pin)
(3-pin)
(4-pin)
⑦
Subject
Camera section
⑤
(30-pin)
To AF board CN4
Battery base
∞ or 2±10.06 m

Fig. 3-4-1 Hooking up for autofocus adjustment

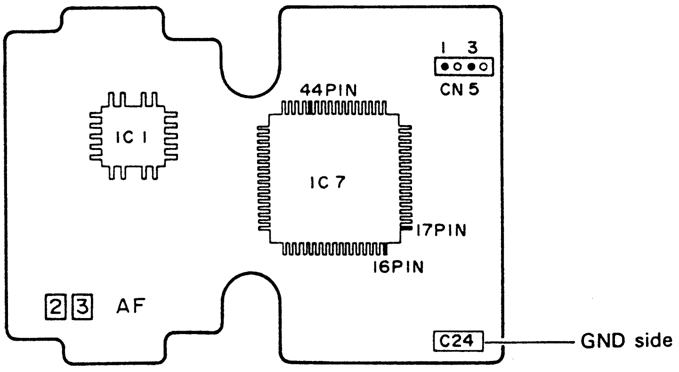
In addition, make the following connections prior to adjusting autofocus. Connection locations all indicate those on the AF board. Turn off the power before connecting patch cords.

1) Connect the GND side of C24 to the TP GND on the adjustment tool. (to connect both GNDs)
2) Connect pin 1 of CN5 to TP 5 V on the adjustment tool. (to supply Vcc to the tool)
3) Connect pin 16 of IC7 to TP A of the adjustment tool and pin 17 of IC7 to TP B of the adjustment tool. (to select zooming direction)
4) Connect pin 44 of IC7 to GND. (to select autofocus to manual mode)

Note: Autofocus adjusting tool;

SW1: Master lens moving direction, select switch — A mode: Macro to Infinity
B mode: Infinity to Macro

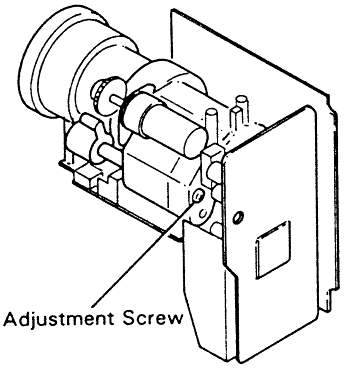
SW2: Mastes lens drive SW (1 push for 1 pulse).



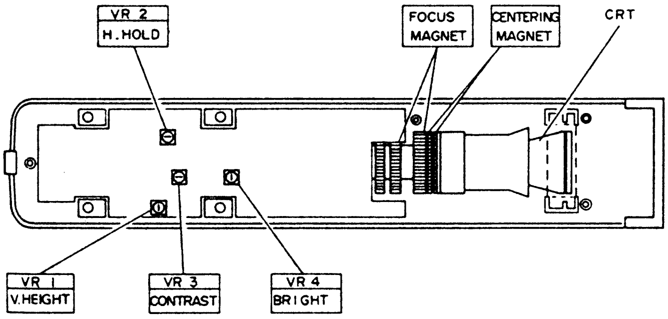
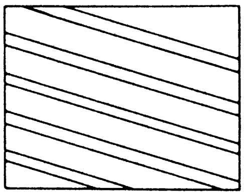
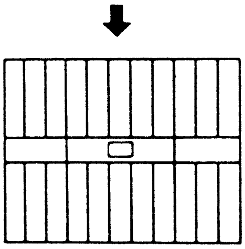
1 3
CN 5
44PIN
IC 1
IC 7
17PIN
16PIN
2 3 AF
C24
GND side

Fig. 3-4-2 AF board

3.4.2 Autoforcus

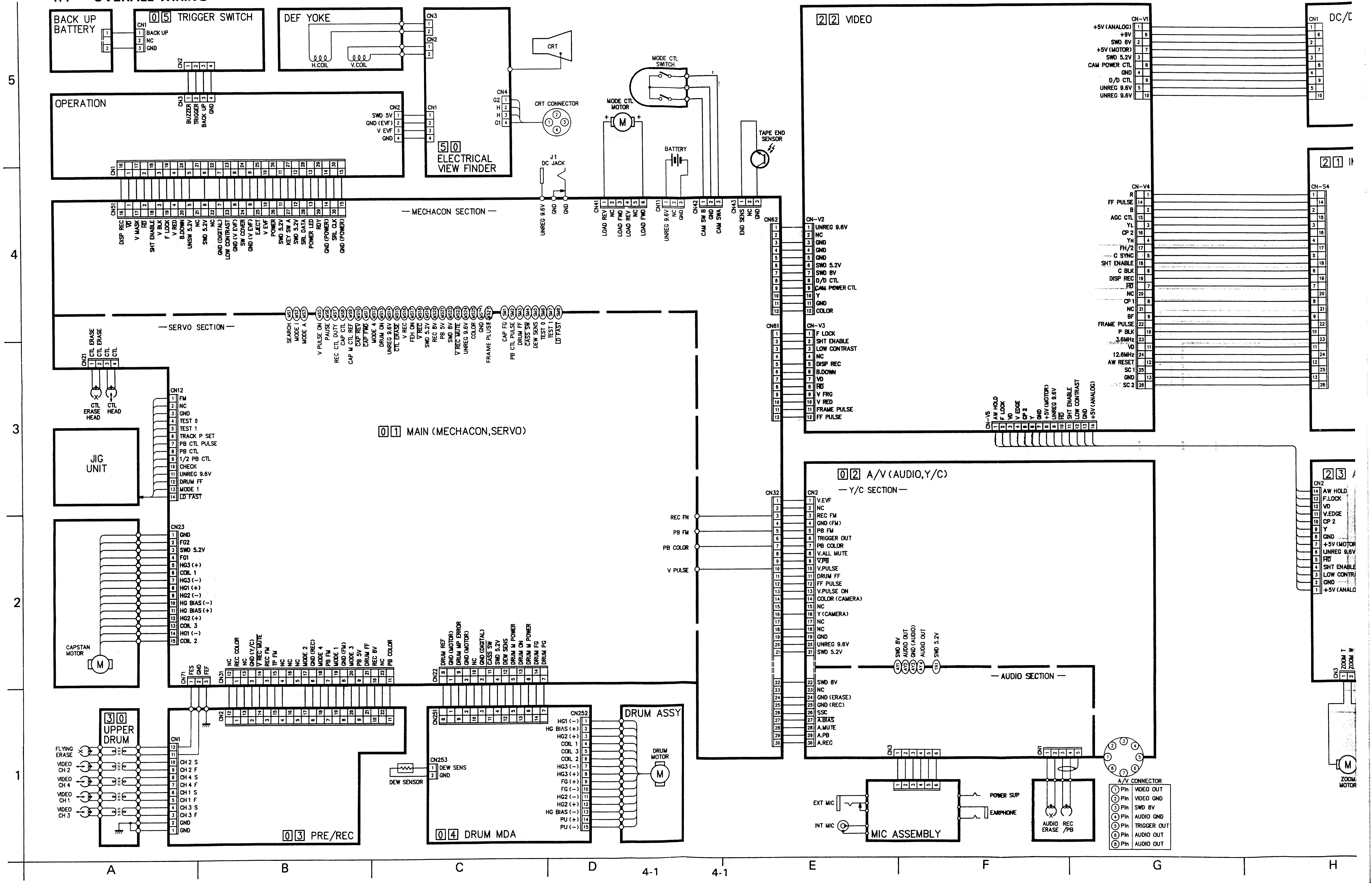
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Confirmation	•E-E	•Monitor TV		1) Pick up a subject at a distance of 50 m or more and confirm the subject is in focus. Voltage at pin-3 of CN5 should be 2.35±0.10 V. **Note:** With fully Tele mode, when changing a distance of a subject from approx. 5 m to approx 30 cm, focusing time should be within approx 8 seconds.
2A	Autofocus	•E-E •50 m or more distance	•CN5 pin 3 (PHOTO TR IN) $\boxed{2}\boxed{3}$ AF  **Fig. 3-4-1** Autofocus adjustment screw	•Autofocus screw	1) Pick up a subject at a distance of 50 m or more. 2) Put the ND filter to the lens to open IRIS. **Note:** If Iris is open, pin 8 of IC5 on the IMS/SSG board must be high level. 3) Push the zoom button to fully TELE mode. 4) While observing the picture on the TV monitor, operate the autofocus adjustment tool for just focus. 5) Turn the adjusting screw on the infinity sensor for 2.35±0.10 VDC at pin 3 of CN5. 6) After No. 1 confirmation put, glue to the adjusting screw to fix it.
2B	Simplified method for autofocus	•E-E •2±0.06 m distance	•CN 5 pin 3 (PHOTO TR IN) $\boxed{2}\boxed{3}$ AF	•Auto focus screw	1) Pick up a subject at a distance of 2±0.06 m. 2) Put the ND filter to the lens to open IRIS. **Note:** If Iris is open, pin 8 of IC5 on the IMS/SSG board must be high level. 3) Push the zoom button to fully TELE mode. 4) While observing the picture on the TV monitor, operate the autofocus adjustment tool for just focus. 5) Select SW1 to A mode and push SW-2 48 times. 6) Turn the adjusting screw on the infinity sensor for 2.35±0.10 VDC at pin 3 of CN5. 7) After No. 1 confirmation, put glue to the adjusting screw to fix it.

3.5 ELECTRONIC VIEW-FINDER

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Horizontal frequency  VR 2 H.HOLD FOCUS MAGNET CENTERING MAGNET CRT VR 1 V.HEIGHT VR 3 CONTRAST VR 4 BRIGHT **Fig. 3-5-1** VF VR position	•Gray scale Monoscope	•View finder screen	•VR2 (H. HOLD) $\boxed{5}\boxed{0}$ VF board	1) While observing the view finder screen, turn VR2 full in a clockwise direction to cause the screen to flow. 2) Slowly turn VR2 in the opposite direction and observe the point where the screen stops. Make a mark on the position on the VR where the screen stops so that you will remember it. 3) Next, turn VR2 all the way in a counter-clockwise direction to cause the screen to flow in the same way as in step (1). 4) Slowly turn VR2 in the opposite direction and observe the point where the screen stops. 5) Set at a point midway between the two points where the screen stopped during adjustment.  (a) H. Frequency-1  (b) The correct value is one where the DC value for IC1-12 pin equals 3.0 V. **Fig. 3-5-2** H. Frequency-2
2	Vertical scanning	•Gray scale or Monoscope	•View finder screen	•VR1 (V. Height) $\boxed{5}\boxed{0}$ VF board	1) While ovserving the view finder screen adjust VR1 to obtain proper V-height.
3	Centering	•Gray scale or Monoscope	•View finder screen	•Centering magnet	1) Pick up the gray scale so that it comes to the middle area of the screen and then adjust the centering magnet so that the gray scale comes to the center of the view finder screen.
4	Focus	•Gray scale or Monoscope	•View finder screen	•Focus magnet	1) While observing the view finder screen, adjust the focus magnet for the deflecting yoke so that the image in the central area of the gray scale screen is clear and defined.
5	Brightness	•Lens cap	•View finder screen	•VR4 (BRIGHT) $\boxed{5}\boxed{0}$ VF board	1) With lens caped, adjust VR4 so that the CRT raster of the view finder can be dimly seen.
6	Contrast	•Gray scale	•View finder screen	•VR3 (CONT) $\boxed{5}\boxed{0}$ VF board	1) While observing the view finder screen, adjust VR3 so that the gray scale gradation is optimum.

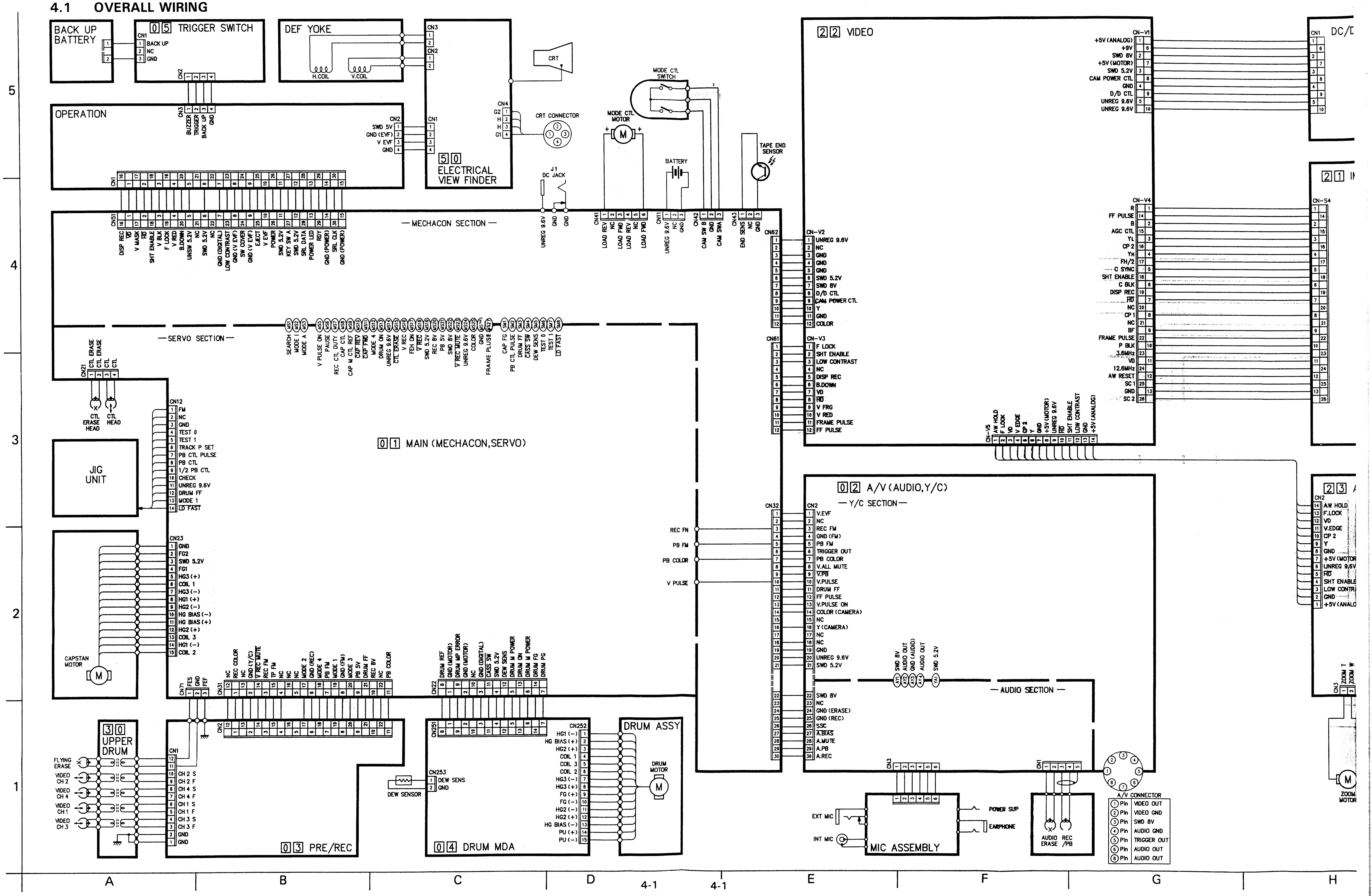
SECTION 4 OVERALL WIRING AND BLOCK DIAGRAMS

4.1 OVERALL WIRING


BACK UP BATTERY
05 TRIGGER SWITCH
CN1 BACK UP NC GND
DEF YOKE
H.COIL
V.COIL
CN3
CN2
CRT
CN4 G2 H H G1
CRT CONNECTOR
50 ELECTRICAL VIEW FINDER
CN1
CN2 SWD 5V GND (EVF) V EVF GND
OPERATION
CN3 BUZZER TRIGGER BACK UP GND
MODE CTL SWITCH
MODE CTL MOTOR
BATTERY
TAPE END SENSOR
J1 DC JACK
UNREG 9.6V GND GND
CN41 LOAD REV NC LOAD FWD LOAD REV NC LOAD FWD
CN11 UNREG 9.6V NC GND
CN42 CAM SW B GND CAM SWA
CN43 END SENS NC GND
CN51 DISP REC VD V MASK HD SHT ENABLE V BLK F LOCK V RED B.DOWN UNSW 5.2V NC SWD 5.2V NC GND (DIGITAL) LOW CONTRAST GND (V EVF) SW COVER GND (V EVF) EJECT V EVF POWER SWD 5.2V KEY SW A SWD 5.2V SRL DATA POWER LED RDY GND (POWER) SRL CLK GND (POWER)
— MECHACON SECTION —
— SERVO SECTION —
CN21 CTL ERASE CTL ERASE CTL CTL
CTL ERASE HEAD
CTL HEAD
SEARCH MODE 1 MODE A V PULSE ON PAUSE REC CTL DUTY CAP CTL CAP M CTL REF CAP REF CAP FWD MODE 4 DRUM ON UNREG 9.6V CTL ERASE V REC FEH ON V REC SWD 5.2V REC 8V PB 5V SWD 8V V REC MUTE UNREG 9.6V COLOR GND FRAME PULSE CAP FG PB CTL PULSE DRUM FF CASS SW DEW SENS TEST 0 TEST 1 LD FAST
CN12 FM NC GND TEST 0 TEST 1 TRACK P SET PB CTL PULSE PB CTL 1/2 PB CTL CHECK UNREG 9.6V DRUM FF MODE 1 LD FAST
JIG UNIT
01 MAIN (MECHACON,SERVO)
CN23 GND FG2 SWD 5.2V FG1 HG3 (+) COIL 1 HG3 (−) HG1 (+) HG2 (−) HG BIAS (−) HG BIAS (+) HG2 (+) COIL 3 HG1 (−) COIL 2
CAPSTAN MOTOR
CN71 FES GND FEF
CN31 NC REC COLOR NC GND (Y/C) V REC MUTE REC FM TP FM NC NC NC MODE 2 GND (REC) MODE 4 PB FM MODE 1 GND (FM) MODE 3 PB 5V DRUM FF REC 8V NC PB COLOR
CN22 DRUM REF GND (MOTOR) DRUM MP ERROR GND (MOTOR) NC GND (DIGITAL) CASS SW SWD 5.2V DEW SENS DRUM M POWER DRUM ON DRUM M POWER DRUM FG DRUM PG
REC FM
PB FM
PB COLOR
V PULSE
CN32
CN61
CN62
30 UPPER DRUM
FLYING ERASE
VIDEO CH 2
VIDEO CH 4
VIDEO CH 1
VIDEO CH 3
CN1 CH 2 S CH 2 F CH 4 S CH 4 F CH 1 S CH 1 F CH 3 S CH 3 F GND GND
CN2
03 PRE/REC
CN251
CN252 HG1 (−) HG BIAS (+) HG2 (+) COIL 1 COIL 3 COIL 2 HG3 (−) HG3 (+) FG (+) FG (−) HG1 (+) HG2 (−) HG BIAS (−) PU (+) PU (−)
CN253 DEW SENS GND
DEW SENSOR
04 DRUM MDA
DRUM ASSY
DRUM MOTOR
22 VIDEO
CN-V1 +5V (ANALOG) +9V SWD 8V +5V (MOTOR) SWD 5.2V CAM POWER CTL GND D/D CTL UNREG 9.6V UNREG 9.6V
CN-V2 UNREG 9.6V NC GND GND GND SWD 5.2V SWD 8V D/D CTL CAM POWER CTL Y GND COLOR
CN-V3 F LOCK SHT ENABLE LOW CONTRAST NC DISP REC B.DOWN VD HD V FRG V RED FRAME PULSE FF PULSE
CN-V4 R FF PULSE B AGC CTL YL CP 2 YH FH/2 C SYNC SHT ENABLE C BLK DISP REC HD NC CP 1 NC BF FRAME PULSE P BLK 3.6MHz VD 12.6MHz AW RESET SC 1 GND SC 2
CN-V5 AW HOLD F LOCK VD V EDGE CP 2 Y GND +5V (MOTOR) UNREG 9.6V HD SHT ENABLE LOW CONTRAST GND +5V (ANALOG)
CN1 DC/D
21 I
CN-S4
02 A/V (AUDIO,Y/C)
— Y/C SECTION —
CN2 V.EVF NC REC FM GND (FM) PB FM TRIGGER OUT PB COLOR V.ALL MUTE V.PB V.PULSE DRUM FF FF PULSE V.PULSE ON COLOR (CAMERA) NC Y (CAMERA) NC NC GND UNREG 9.6V SWD 5.2V
SWD 8V NC GND (ERASE) GND (REC) SSC A.BIAS A.MUTE A.PB A.REC
SWD 8V AUDIO OUT GND (AUDIO) AUDIO OUT SWD 5.2V
— AUDIO SECTION —
CN3
CN1
EXT MIC
INT MIC
MIC ASSEMBLY
POWER SUP
EARPHONE
AUDIO ERASE
REC /PB
A/V CONNECTOR
①Pin VIDEO OUT
②Pin VIDEO GND
③Pin SWD 8V
④Pin AUDIO GND
⑤Pin TRIGGER OUT
⑥Pin AUDIO OUT
⑦Pin AUDIO OUT
⑧Pin AUDIO OUT
23
CN2 AW HOLD F.LOCK VD V.EDGE CP 2 Y GND +5V (MOTOR) UNREG 9.6V HD SHT ENABLE LOW CONTRAST GND +5V (ANALOG)
CN3 ZOOM T ZOOM
ZOOM MOTOR
5
4
3
2
1
A
B
C
D
E
F
G
H

SECTION 4 OVERALL WIRING AND BLOCK DIAGRAMS

4.1 OVERALL WIRING

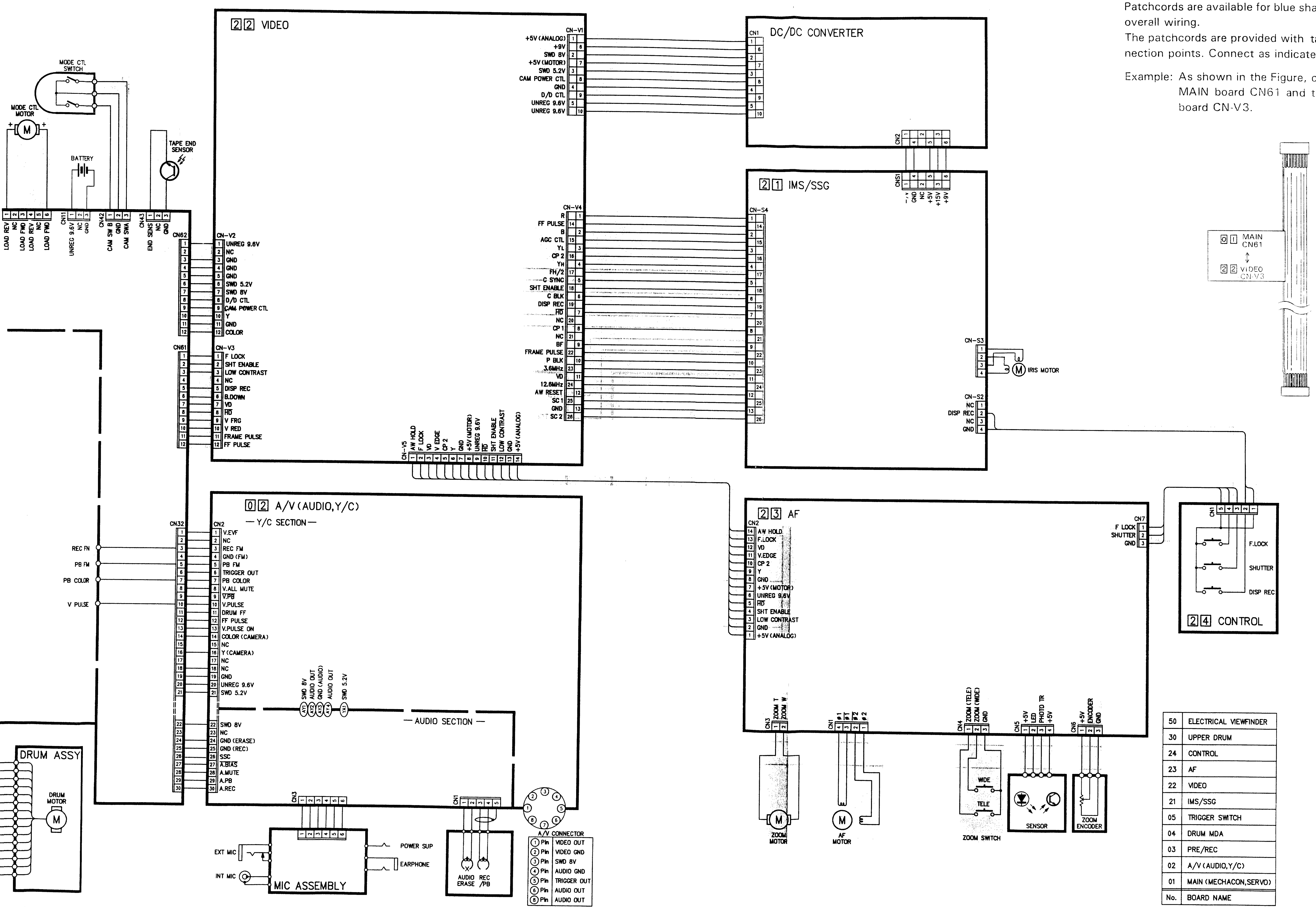

BACK UP BATTERY
05 TRIGGER SWITCH
CN1 1 BACK UP 2 NC 3 GND
CN2
DEF YOKE
H.COIL
V.COIL
CN3 CN2
CRT
OPERATION
CN3 BUZZER TRIGGER BACK UP GND
CN2 SWD 5V GND (EVF) V EVF GND
CN1
50 ELECTRICAL VIEW FINDER
CN4 G2 H H G1
CRT CONNECTOR
MODE CTL SWITCH
MODE CTL MOTOR
BATTERY
TAPE END SENSOR
J1 DC JACK
UNREG 9.6V GND GND
CN41 LOAD REV NC LOAD FWD LOAD REV NC LOAD FWD
CN11 UNREG 9.6V NC GND
CN42 CAM SW B GND CAM SWA
CN43 END SENS NC GND
CN51 DISP REC VD V MASK HD SHT ENABLE V BLK F LOCK V RED B.DOWN UNSW 5.2V NC SWD 5.2V NC GND (DIGITAL) LOW CONTRAST GND (V EVF) SW COVER GND (V EVF) EJECT V EVF POWER SWD 5.2V KEY SW A SWD 5.2V SRL DATA POWER LED RDY GND (POWER) SRL CLK GND (POWER)
— MECHACON SECTION —
— SERVO SECTION —
SEARCH MODE I MODE A V PULSE ON PAUSE REC CTL DUTY CAP CTL CAP M CTL REF CAP REV CAP FWD MODE 4 DRUM ON UNREG 9.6V CTL ERASE V REC FEH ON V REC SWD 5.2V PB 8V PB 5V SWD 8V V REC MUTE UNREG 9.6V COLOR GND FRAME PULSE CAP FG PB CTL PULSE DRUM FF CASS SW DEW SENS TEST 0 TEST 1 LD FAST
CN21 CTL ERASE CTL ERASE CTL CTL
CTL ERASE HEAD
CTL HEAD
CN12 FM NC GND TEST 0 TEST 1 TRACK P SET PB CTL PULSE PB CTL 1/2 PB CTL CHECK UNREG 9.6V DRUM FF MODE 1 LD FAST
JIG UNIT
01 MAIN (MECHACON,SERVO)
CN23 GND FG2 SWD 5.2V FG1 HG3 (+) COIL 1 HG3 (−) HG1 (+) HG2 (−) HG BIAS (−) HG BIAS (+) HG2 (+) COIL 3 HG1 (−) COIL 2
CAPSTAN MOTOR
CN71 FES GND FEF
CN31 NC REC COLOR NC GND (Y/C) V REC MUTE REC FM TP FM NC NC MODE 2 GND (REC) MODE 4 PB FM MODE 1 GND (FM) MODE 3 PB 5V DRUM FF NC PB COLOR
CN22 DRUM REF GND (MOTOR) DRUM MP ERROR GND (MOTOR) NC GND (DIGITAL) CASS SW SWD 5.2V DEW SENS DRUM M POWER DRUM ON DRUM M POWER DRUM FG DRUM PG
REC FM
PB FM
PB COLOR
V PULSE
CN32
CN61
CN62
30 UPPER DRUM
FLYING ERASE
VIDEO CH 2
VIDEO CH 4
VIDEO CH 1
VIDEO CH 3
CN1 CH 2 S CH 2 F CH 4 S CH 4 F CH 1 S CH 1 F CH 3 S CH 3 F GND GND
CN2
03 PRE/REC
DEW SENSOR
CN251
CN253 DEW SENS GND
CN252 HG1 (−) HG BIAS (+) HG2 (+) COIL 1 COIL 3 COIL 2 HG3 (−) HG3 (+) FG (+) FG (−) HG2 (−) HG2 (+) HG BIAS (−) PU (+) PU (−)
04 DRUM MDA
DRUM ASSY
DRUM MOTOR
22 VIDEO
CN-V1 +5V (ANALOG) +9V SWD 8V +5V (MOTOR) SWD 5.2V CAM POWER CTL GND D/D CTL UNREG 9.6V UNREG 9.6V
CN-V2 UNREG 9.6V NC GND GND GND SWD 5.2V SWD 8V D/D CTL CAM POWER CTL Y GND COLOR
CN-V3 F LOCK SHT ENABLE LOW CONTRAST NC DISP REC B.DOWN VD HD V FRG V RED FRAME PULSE FF PULSE
CN-V4 R FF PULSE B AGC CTL YL YH FH/2 C SYNC SHT ENABLE C BLK DISP REC HD NC CP 1 NC BF FRAME PULSE P BLK 3.6MHz VD 12.6MHz AW RESET SC 1 GND SC 2
CN-V5 AW HOLD F LOCK VD V EDGE CP 2 Y GND +5V (MOTOR) UNREG 9.6V HD SHT ENABLE LOW CONTRAST GND +5V (ANALOG)
02 A/V (AUDIO,Y/C)
— Y/C SECTION —
CN2 V.EVF NC REC FM GND (FM) PB FM TRIGGER OUT PB COLOR V.ALL MUTE V.PB V.PULSE DRUM FF FF PULSE V.PULSE ON COLOR (CAMERA) NC Y (CAMERA) NC NC GND UNREG 9.6V SWD 5.2V SWD 8V NC GND (ERASE) GND (REC) SSC A.BIAS A.MUTE A.PB A.REC
SWD 8V AUDIO OUT GND (AUDIO) AUDIO OUT SWD 5.2V
— AUDIO SECTION —
CN3
CN1
EXT MIC
INT MIC
MIC ASSEMBLY
POWER SUP
EARPHONE
AUDIO ERASE
REC /PB
A/V CONNECTOR
① Pin VIDEO OUT
② Pin VIDEO GND
③ Pin SWD 8V
④ Pin AUDIO GND
⑤ Pin TRIGGER OUT
⑥ Pin AUDIO OUT
⑧ Pin AUDIO OUT
DC/D
21 I
CN1
CN-S4
23
CN2 AW HOLD F.LOCK VD V.EDGE CP 2 Y GND +5V (MOTOR) UNREG 9.6V HD SHT ENABLE LOW CONTRA GND +5V (ANALO
CN3 ZOOM T ZOOM W
ZOOM MOTOR
5
4
3
2
1
A
B
C
D
E
F
G
H

Patchcords

Patchcords are available for blue shaded portions of the overall wiring.

The patchcords are provided with tags to indicate connection points. Connect as indicated.

Example: As shown in the Figure, connect one side to MAIN board CN61 and the other to VIDEO board CN-V3.

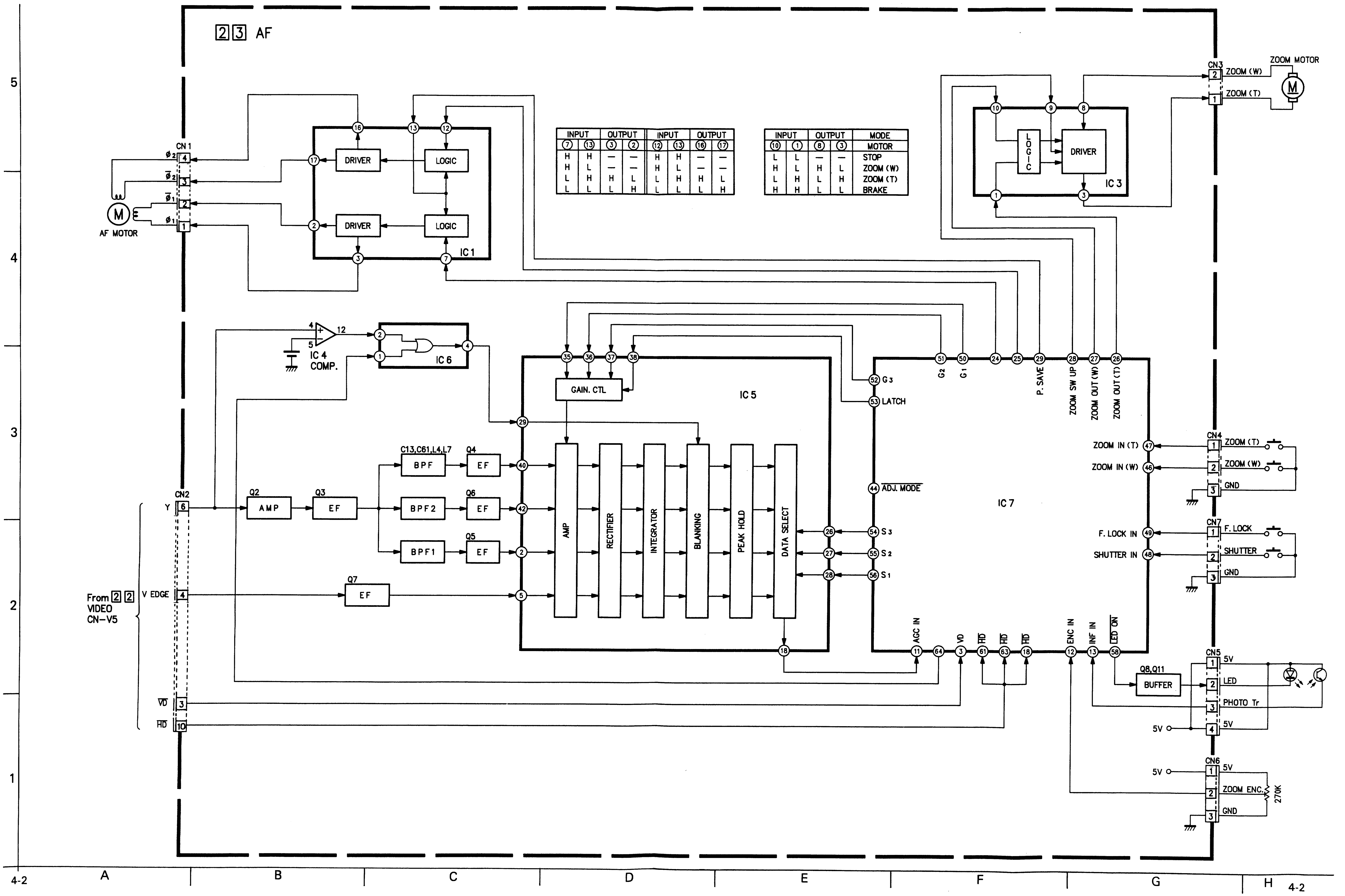


22 VIDEO
CN-V1
+5V (ANALOG)
+9V
SWD 8V
+5V (MOTOR)
SWD 5.2V
CAM POWER CTL
GND
D/D CTL
UNREG 9.6V
UNREG 9.6V
DC/DC CONVERTER
CN1
CN2
CNS1
21 IMS/SSG
CN-S4
CN-S3
IRIS MOTOR
CN-S2
NC
DISP REC
NC
GND
CN-V4
R
FF PULSE
B
AGC CTL
YL
CP 2
YH
FH/2
C SYNC
SHT ENABLE
C BLK
DISP REC
HD
NC
CP 1
NC
BF
FRAME PULSE
P BLK
3.6MHz
VD
12.6MHz
AW RESET
SC 1
GND
SC 2
CN-V2
UNREG 9.6V
NC
GND
GND
GND
SWD 5.2V
SWD 8V
D/D CTL
CAM POWER CTL
Y
GND
COLOR
CN-V3
F LOCK
SHT ENABLE
LOW CONTRAST
NC
DISP REC
B.DOWN
VD
HD
V FRG
V RED
FRAME PULSE
FF PULSE
CN-V5
AW HOLD
F LOCK
VD
V EDGE
CP 2
Y
GND
+5V (MOTOR)
UNREG 9.6V
HD
SHT ENABLE
LOW CONTRAST
GND
+5V (ANALOG)
CN62
CN61
CN32
MODE CTL SWITCH
MODE CTL MOTOR
BATTERY
TAPE END SENSOR
LOAD REV
NC
LOAD FWD
LOAD REV
NC
LOAD FWD
CN11
UNREG 9.6V
NC
GND
CN42
CAM SW B
GND
CAM SWA
CN43
END SENS
NC
GND
REC FM
PB FM
PB COLOR
V PULSE
02 A/V (AUDIO,Y/C)
— Y/C SECTION —
CN2
V.EVF
NC
REC FM
GND (FM)
PB FM
TRIGGER OUT
PB COLOR
V.ALL MUTE
V.PB
V.PULSE
DRUM FF
FF PULSE
V.PULSE ON
COLOR (CAMERA)
NC
Y (CAMERA)
NC
NC
GND
UNREG 9.6V
SWD 5.2V
SWD 8V
AUDIO OUT
GND (AUDIO)
AUDIO OUT
SWD 5.2V
— AUDIO SECTION —
SWD 8V
NC
GND (ERASE)
GND (REC)
SSC
A.BIAS
A.MUTE
A.PB
A.REC
CN3
CN1
DRUM ASSY
DRUM MOTOR
EXT MIC
INT MIC
MIC ASSEMBLY
POWER SUP
EARPHONE
AUDIO ERASE
REC /PB
A/V CONNECTOR
① Pin VIDEO OUT
② Pin VIDEO GND
③ Pin SWD 8V
④ Pin AUDIO GND
⑤ Pin TRIGGER OUT
⑥ Pin AUDIO OUT
⑧ Pin AUDIO OUT
23 AF
CN2
AW HOLD
F.LOCK
VD
V.EDGE
CP 2
Y
GND
+5V (MOTOR)
UNREG 9.6V
HD
SHT ENABLE
LOW CONTRAST
GND
+5V (ANALOG)
CN7
F LOCK
SHUTTER
GND
24 CONTROL
CN1
F.LOCK
SHUTTER
DISP REC
CN3
ZOOM T
ZOOM W
ZOOM MOTOR
CN1
AF MOTOR
CN4
ZOOM (TELE)
ZOOM (WIDE)
GND
WIDE
TELE
ZOOM SWITCH
CN5
+5V
LED
PHOTO TR
+5V
SENSOR
CN6
+5V
ENCODER
GND
ZOOM ENCODER
01 MAIN CN61
22 VIDEO CN-V3

No.	BOARD NAME
50	ELECTRICAL VIEWFINDER
30	UPPER DRUM
24	CONTROL
23	AF
22	VIDEO
21	IMS/SSG
05	TRIGGER SWITCH
04	DRUM MDA
03	PRE/REC
02	A/V (AUDIO,Y/C)
01	MAIN (MECHACON,SERVO)

4-1 4-1 E F G H I J K L

4.2 AF BLOCK DIAGRAM

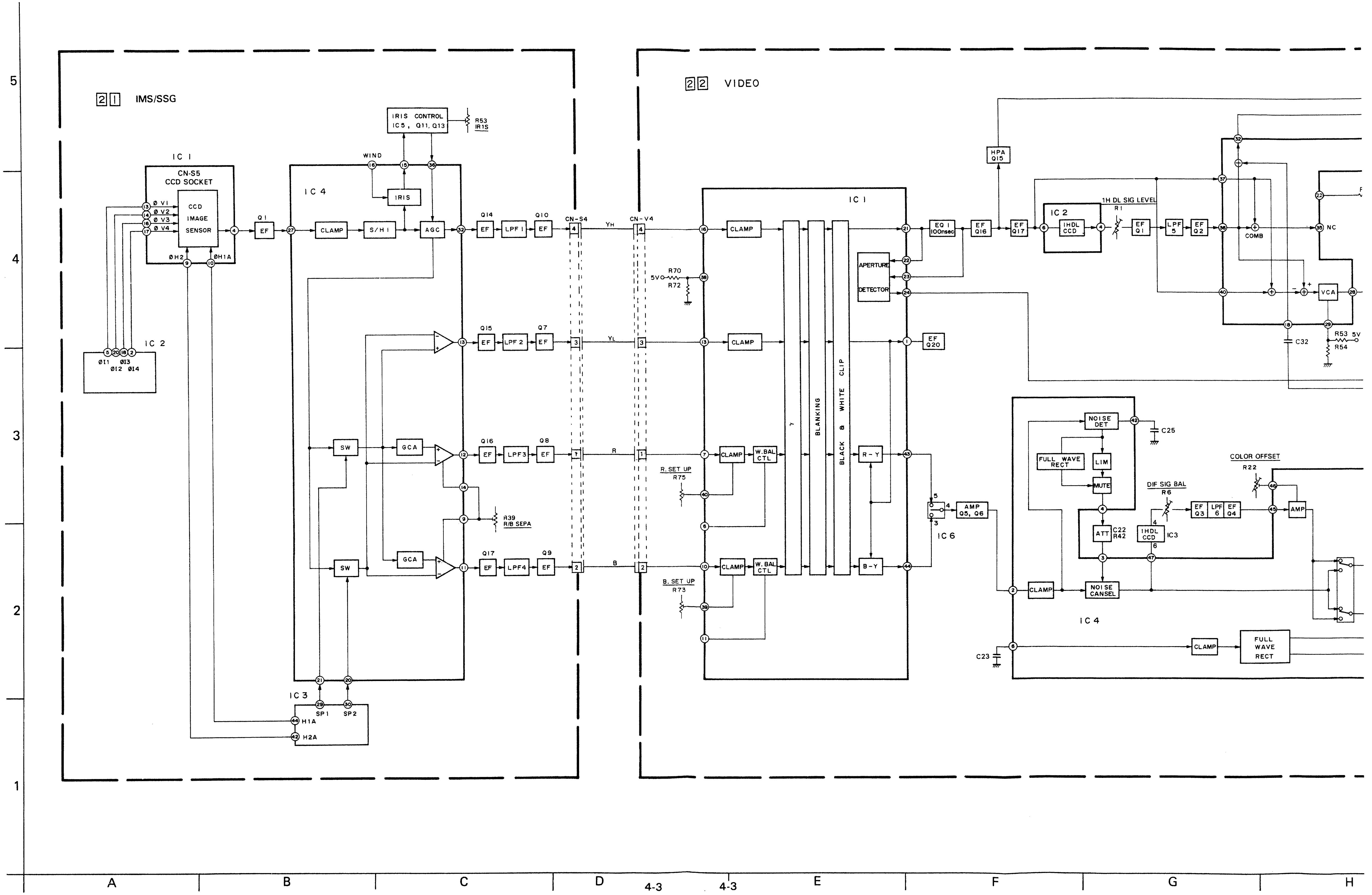


2 3 AF
CN 1
ø2
ø2
ø1
ø1
4
3
2
1
M
AF MOTOR
16
13
12
17
DRIVER
LOGIC
2
DRIVER
LOGIC
3
7
IC 1
ZOOM MOTOR
CN3
2
ZOOM (W)
1
ZOOM (T)
M
10
9
8
L O G I C
DRIVER
1
3
IC 3
4
+
−
5
12
IC 4
COMP.
2
1
IC 6
4
35
36
37
38
GAIN. CTL
IC 5
29
40
42
2
5
AMP
RECTIFIER
INTEGRATOR
BLANKING
PEAK HOLD
DATA SELECT
26
27
28
18
C13,C61,L4,L7
BPF
Q4
EF
BPF2
Q6
EF
BPF1
Q5
EF
Q2
AMP
Q3
EF
Q7
EF
CN2
Y
6
V EDGE
4
VD
3
HD
10
From 2 2
VIDEO
CN-V5
51
50
24
25
29
28
27
26
G2
G1
P. SAVE
ZOOM SW UP
ZOOM OUT (W)
ZOOM OUT (T)
52 G3
53 LATCH
44 ADJ. MODE
54 S3
55 S2
56 S1
IC 7
ZOOM IN (T) 47
ZOOM IN (W) 46
F. LOCK IN 49
SHUTTER IN 48
AGC IN
11
64
VD
3
HD
61
HD
63
HD
18
ENC IN
12
INF IN
13
LED ON
58
CN4
1 ZOOM (T)
2 ZOOM (W)
3 GND
CN7
1 F. LOCK
2 SHUTTER
3 GND
Q8,Q11
BUFFER
CN5
1 5V
2 LED
3 PHOTO Tr
4 5V
5V
CN6
1 5V
2 ZOOM ENC.
3 GND
270K
5V
A
B
C
D
E
F
G
H
1
2
3
4
5

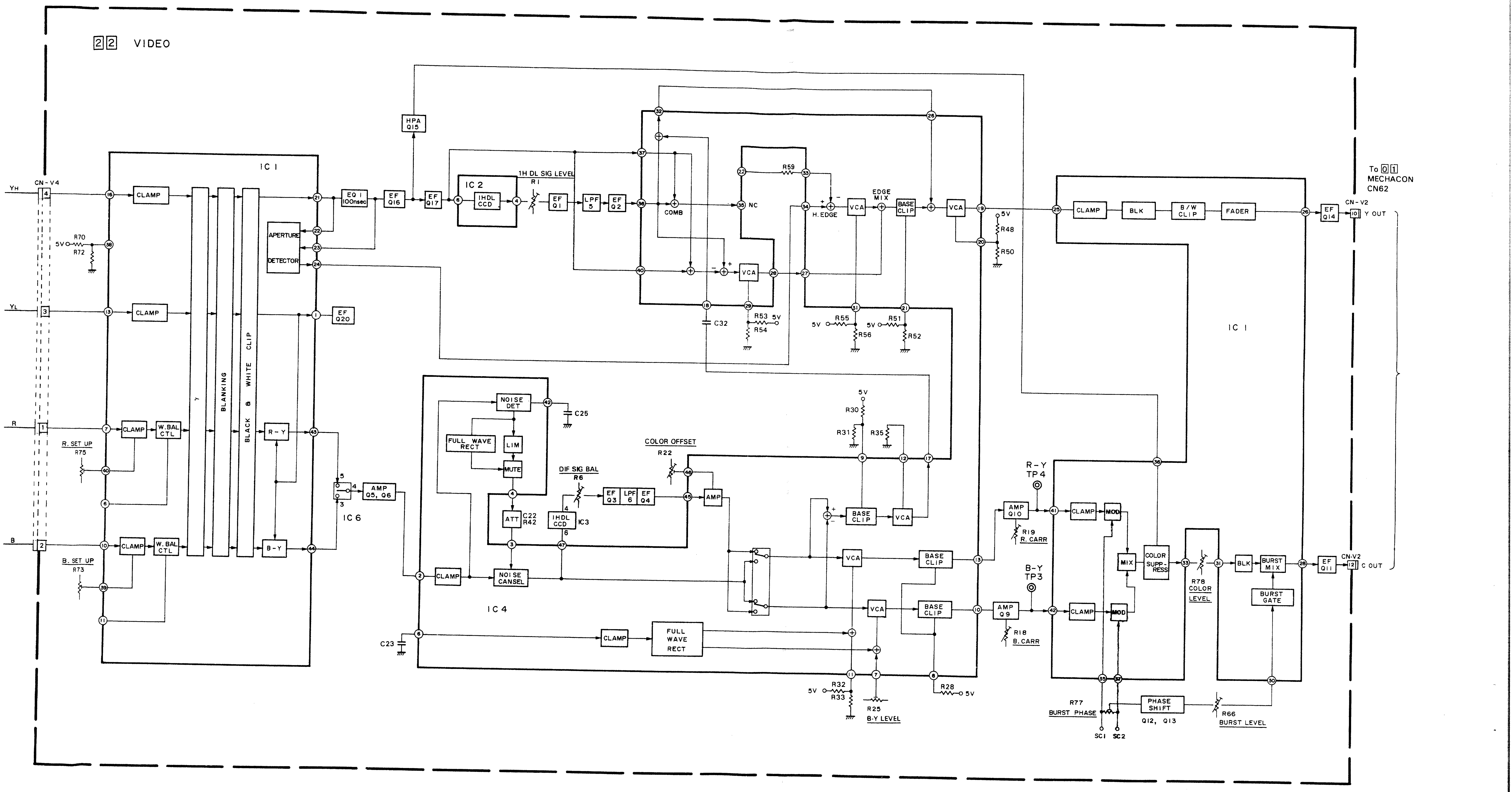
INPUT		OUTPUT		INPUT		OUTPUT	
⑦	⑬	③	②	⑫	⑬	⑯	⑰
H	H	—	—	H	H	—	—
H	L	—	—	H	L	—	—
L	H	H	L	L	H	H	L
L	L	L	H	L	L	L	H

INPUT		OUTPUT		MODE
⑩	①	⑧	③	MOTOR
L	L	—	—	STOP
H	L	H	L	ZOOM (W)
L	H	L	H	ZOOM (T)
H	H	L	L	BRAKE

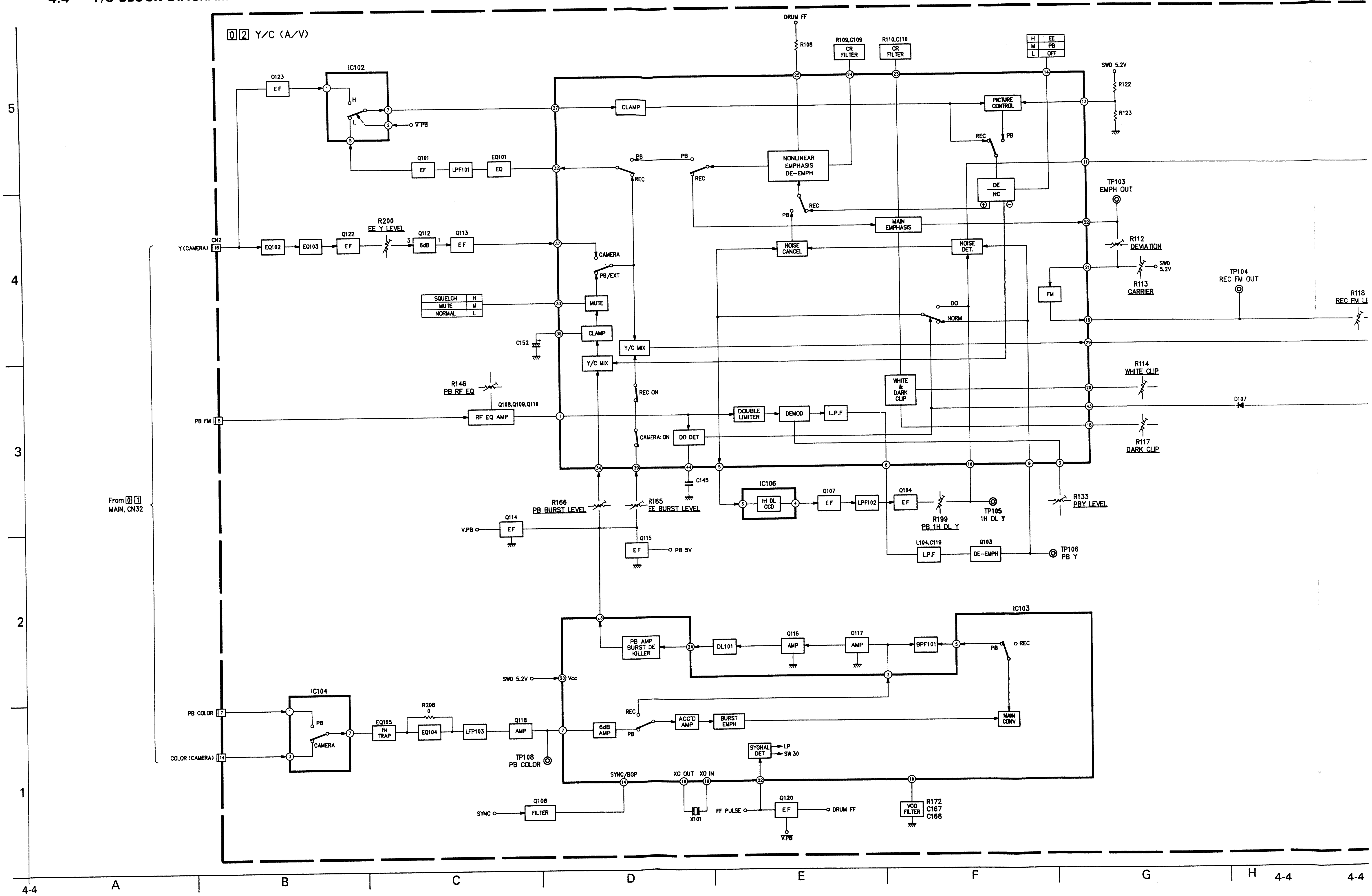
4.3 CAMERA VIDEO BLOCK DIAGRAMS



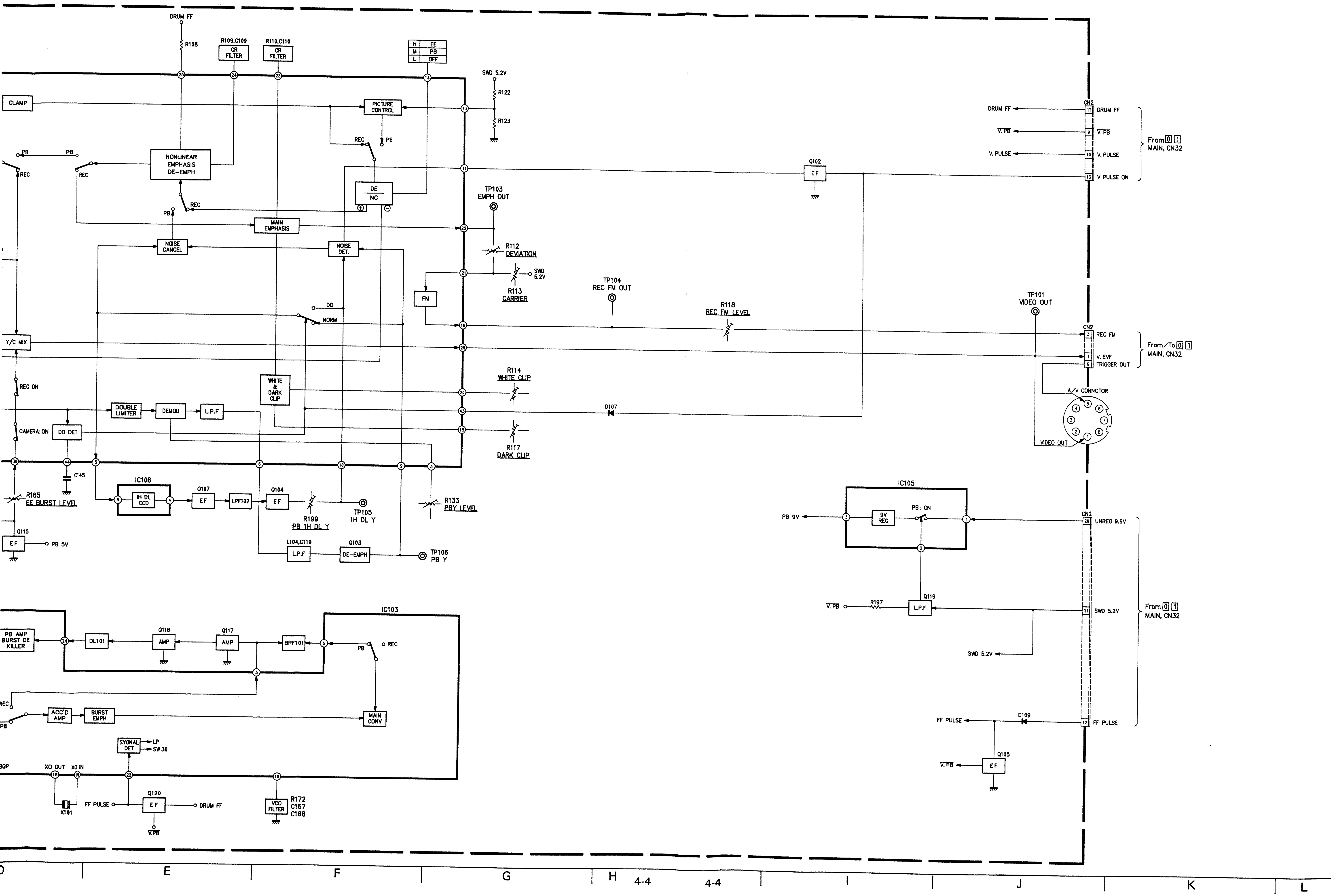
21 IMS/SSG
IC 1
CN-S5 CCD SOCKET
CCD IMAGE SENSOR
Ø V1
Ø V2
Ø V3
Ø V4
ØH2
ØH1A
IC 2
Ø11 Ø13
Ø12 Ø14
Q1
EF
IC 4
IRIS CONTROL IC5, Q11, Q13
R53 IRIS
WIND
IRIS
CLAMP
S/H I
AGC
Q14 EF
LPF 1
Q10 EF
Q15 EF
LPF 2
Q7 EF
SW
GCA
Q16 EF
LPF3
Q8 EF
R39 R/B SEPA
Q17 EF
LPF4
Q9 EF
IC 3
SP1
SP2
H1A
H2A
CN-S4
CN-V4
YH
YL
R
B
22 VIDEO
IC 1
R70
5V
R72
R. SET UP
R75
B. SET UP
R73
CLAMP
W. BAL CTL
γ
BLANKING
BLACK & WHITE CLIP
R-Y
B-Y
APERTURE DETECTOR
EQ 1 100nsec
EF Q16
EF Q17
HPA Q15
IC 2
1HDL CCD
1H DL SIG LEVEL
R1
EF Q1
LPF 5
EF Q2
COMB
NC
VCA
C32
R53
5V
R54
EF Q20
IC 6
AMP Q5, Q6
NOISE DET
C25
FULL WAVE RECT
LIM
MUTE
ATT
C22 R42
1HDL CCD
IC3
DIF SIG BAL
R6
EF Q3
LPF 6
EF Q4
COLOR OFFSET
R22
AMP
CLAMP
NOISE CANSEL
IC 4
C23
CLAMP
FULL WAVE RECT
A
B
C
D
E
F
G
H
1
2
3
4
5


22 VIDEO
YH
YL
R
B
CN-V4
R70
5V
R72
R. SET UP
R75
B. SET UP
R73
IC 1
CLAMP
γ
BLANKING
BLACK & WHITE CLIP
APERTURE DETECTOR
W.BAL CTL
R-Y
B-Y
EQ 1 100nsec
EF Q16
EF Q17
EF Q20
HPA Q15
IC 2
1HDL CCD
1H DL SIG LEVEL
R1
EF Q1
LPF 5
EF Q2
COMB
NC
C32
R53
5V
R54
R59
H. EDGE
EDGE MIX
VCA
BASE CLIP
R55
R56
R51
R52
R48
R50
5V
IC 6
AMP Q5, Q6
IC 4
NOISE DET
C25
FULL WAVE RECT
LIM
MUTE
ATT
C22 R42
NOISE CANSEL
1HDL CCD
IC3
DIF SIG BAL
R6
EF Q3
LPF 6
EF Q4
COLOR OFFSET
R22
AMP
C23
FULL WAVE RECT
R30
R31
R35
R32
R33
R25
B-Y LEVEL
R28
R-Y TP4
B-Y TP3
AMP Q10
R19
R. CARR
AMP Q9
R18
B. CARR
MOD
MIX
COLOR SUPP-RESS
R78
COLOR LEVEL
BLK
BURST MIX
BURST GATE
PHASE SHIFT
Q12, Q13
R77
BURST PHASE
R66
BURST LEVEL
SC1
SC2
B/W CLIP
FADER
EF Q14
EF Q11
CN-V2
Y OUT
C OUT
To 01 MECHACON CN62

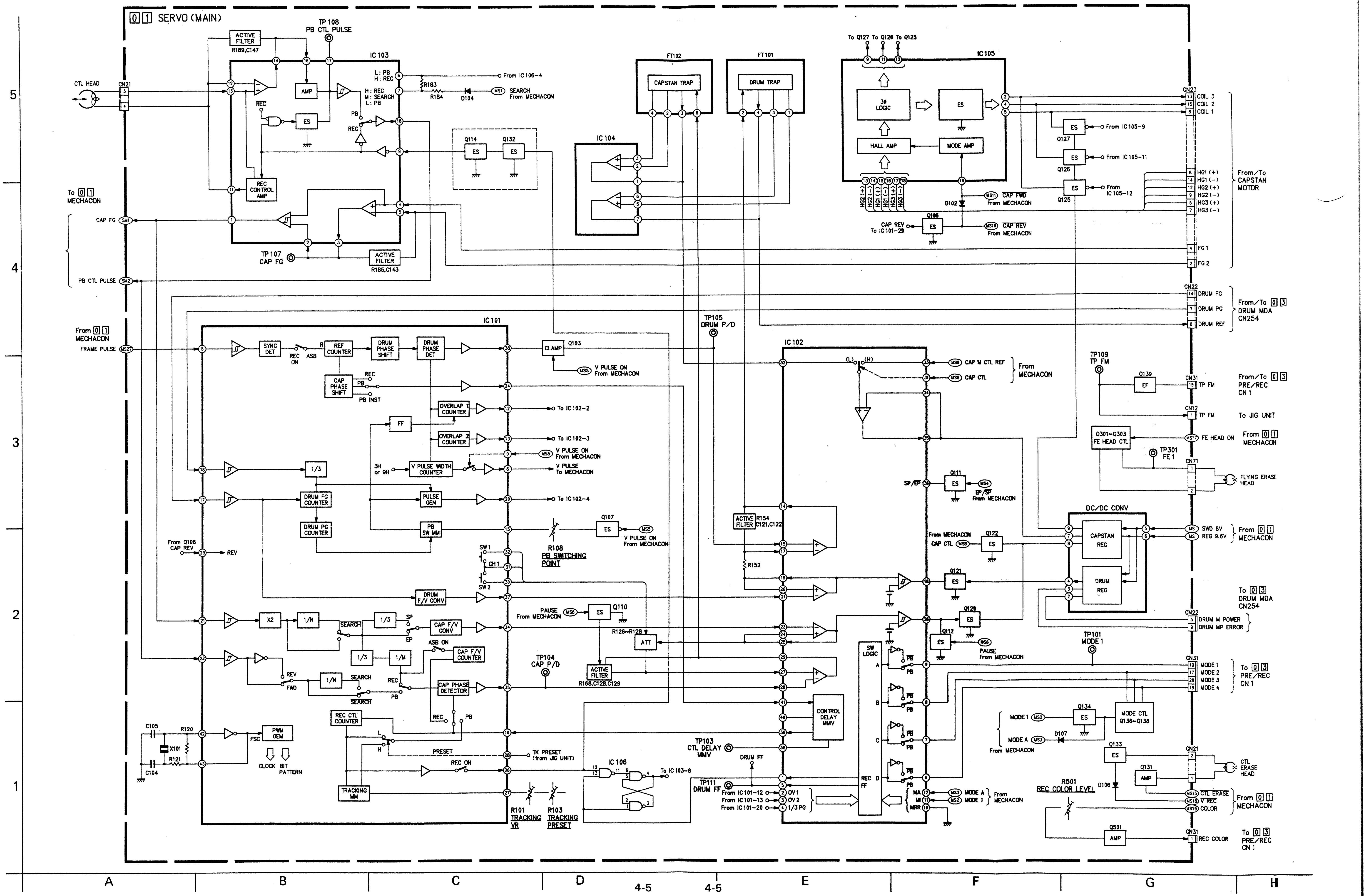
4.4 Y/C BLOCK DIAGRAM



02 Y/C (A/V)
IC102
Q123
EF
H
L
V PB
Q101
LPF101
EQ101
EQ
CN2
Y (CAMERA)
16
EQ102
EQ103
Q122
R200
EE Y LEVEL
Q112
6dB
Q113
SQUELCH H
MUTE M
NORMAL L
C152
R146
PB RF EQ
Q108,Q109,Q110
RF EQ AMP
PB FM
5
From 01
MAIN, CN32
DRUM FF
R108
R109,C109
CR FILTER
R110,C110
CR FILTER
H EE
M PB
L OFF
SWD 5.2V
R122
R123
CLAMP
PICTURE CONTROL
REC
PB
NONLINEAR EMPHASIS DE-EMPH
DE NC
MAIN EMPHASIS
NOISE CANCEL
NOISE DET.
CAMERA
PB/EXT
MUTE
Y/C MIX
REC ON
CAMERA:ON
DO DET
DOUBLE LIMITER
DEMOD
L.P.F
DO
NORM
WHITE & DARK CLIP
FM
TP103
EMPH OUT
R112
DEVIATION
R113
CARRIER
TP104
REC FM OUT
R118
REC FM L
R114
WHITE CLIP
D107
R117
DARK CLIP
C145
R166
PB BURST LEVEL
R165
EE BURST LEVEL
IC106
1H DL CCD
Q107
LPF102
Q104
R199
PB 1H DL Y
TP105
1H DL Y
R133
PBY LEVEL
Q114
V.PB
Q115
PB 5V
L104,C119
Q103
DE-EMPH
TP106
PB Y
IC103
PB AMP BURST DE KILLER
DL101
Q116
AMP
Q117
BPF101
SWD 5.2V
Vcc
IC104
PB COLOR
COLOR (CAMERA)
EQ105
fH TRAP
R208
0
EQ104
LFP103
Q118
TP108
PB COLOR
6dB AMP
ACC'D AMP
BURST EMPH
MAIN CONV
SYGNAL DET
LP
SW 30
SYNC/BGP
XO OUT
XO IN
SYNC
Q106
FILTER
X101
FF PULSE
Q120
V.PB
DRUM FF
VCO FILTER
R172
C167
C168
1
2
3
4
5
A
B
C
D
E
F
G
H

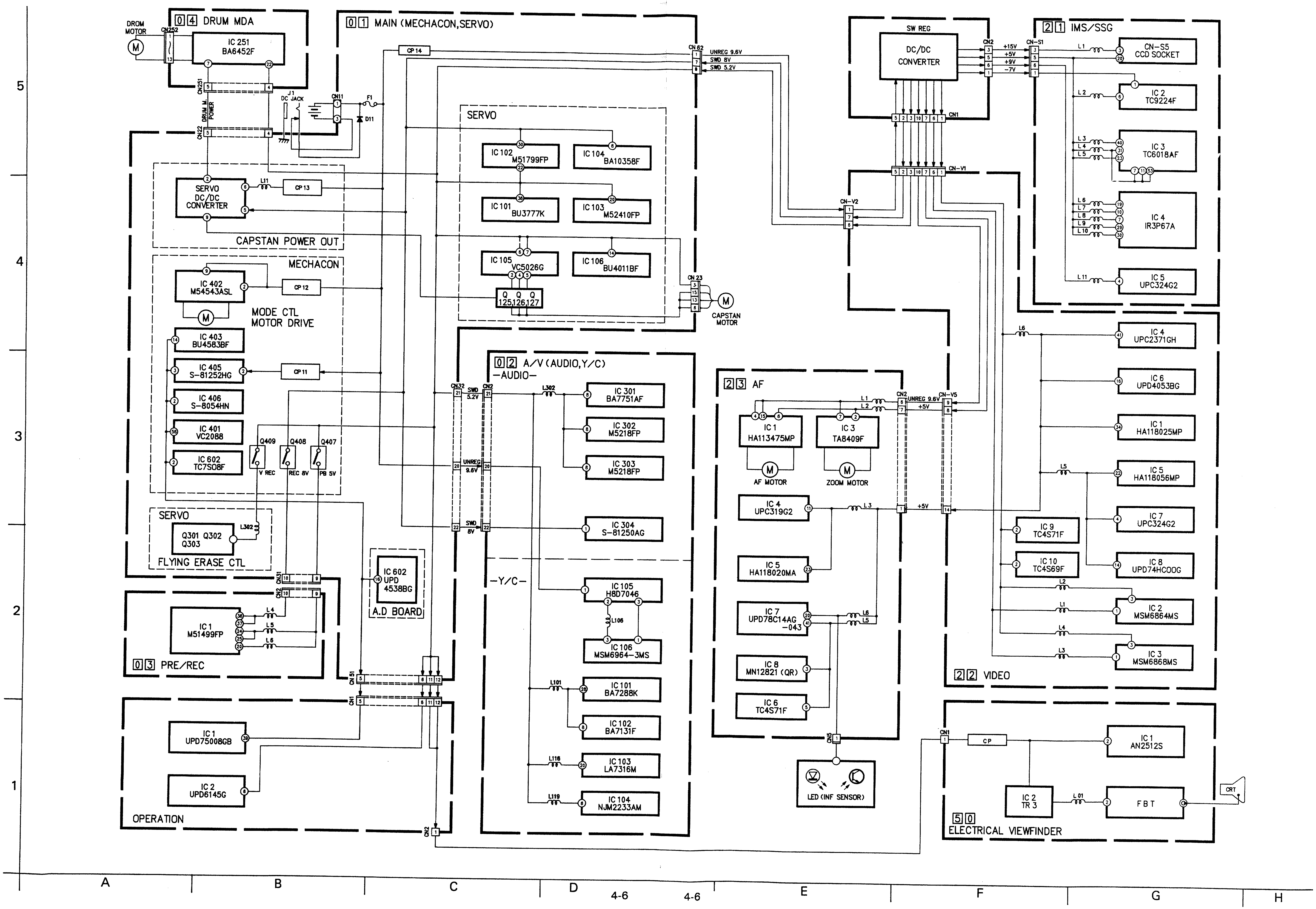

DRUM FF
R108
R109,C109
CR FILTER
R110,C110
CR FILTER
H EE
M PB
L OFF
SWD 5.2V
R122
R123
CLAMP
PICTURE CONTROL
REC
PB
NONLINEAR EMPHASIS DE-EMPH
DE NC
MAIN EMPHASIS
NOISE CANCEL
NOISE DET.
TP103 EMPH OUT
R112 DEVIATION
R113 CARRIER
SWD 5.2V
FM
DO
NORM
TP104 REC FM OUT
R118 REC FM LEVEL
Q102
EF
TP101 VIDEO OUT
Y/C MIX
REC ON
CAMERA: ON
DO DET
WHITE & DARK CLIP
R114 WHITE CLIP
D107
R117 DARK CLIP
DOUBLE LIMITER
DEMOD
L.P.F
C145
IC106
1H DL CCD
Q107
EF
LPF102
Q104
EF
R199 PB 1H DL Y
TP105 1H DL Y
R133 PBY LEVEL
R165 EE BURST LEVEL
Q115
EF
PB 5V
L104,C119
L.P.F
Q103
DE-EMPH
TP106 PB Y
CN2
DRUM FF
V.PB
V. PULSE
V PULSE ON
From 0 1 MAIN, CN32
REC FM
V. EVF
TRIGGER OUT
From/To 0 1 MAIN, CN32
A/V CONNCTOR
VIDEO OUT
IC105
PB 9V
9V REG
PB : ON
UNREG 9.6V
Q119
V.PB
R197
L.P.F
SWD 5.2V
From 0 1 MAIN, CN32
FF PULSE
D109
Q105
EF
IC103
PB AMP BURST DE KILLER
DL101
Q116
AMP
Q117
AMP
BPF101
REC
PB
ACC'D AMP
BURST EMPH
MAIN CONV
SYGNAL DET
LP
SW 30
BGP
XO OUT
XO IN
X101
FF PULSE
Q120
EF
DRUM FF
V.PB
VCO FILTER
R172
C167
C168
D
E
F
G
H
I
J
K
L

4.5 SERVO BLOCK DIAGRAM



0 1 SERVO (MAIN)
CTL HEAD
CN21
ACTIVE FILTER
R189,C147
TP 108
PB CTL PULSE
IC 103
L: PB
H: REC
AMP
REC
ES
PB
REC
H: REC
M: SEARCH
L: PB
R183
R184
D104
From IC 106-4
MS1 SEARCH From MECHACON
REC CONTROL AMP
To 0 1 MECHACON
CAP FG
SM1
PB CTL PULSE
SM2
TP 107
CAP FG
ACTIVE FILTER
R185,C143
Q114
Q132
ES
FT102
CAPSTAN TRAP
FT101
DRUM TRAP
IC 104
To Q127 To Q126 To Q125
IC 105
3φ LOGIC
ES
HALL AMP
MODE AMP
HG2(+) HG2(−) HG1(+) HG1(−) HG3(+) HG3(−)
D102
MS11 CAP FWD From MECHACON
Q186
CAP REV To IC 101-29
MS10 CAP REV From MECHACON
Q127
From IC 105-9
Q126
From IC 105-11
Q125
From IC 105-12
CN23
COIL 3
COIL 2
COIL 1
HG1 (+)
HG1 (−)
HG2 (+)
HG2 (−)
HG3 (+)
HG3 (−)
From/To CAPSTAN MOTOR
FG 1
FG 2
CN22
DRUM FG
DRUM PG
DRUM REF
From/To 0 3 DRUM MDA CN254
From 0 1 MECHACON
FRAME PULSE
MS27
IC 101
SYNC DET
REC ON
ASB
REF COUNTER
DRUM PHASE SHIFT
DRUM PHASE DET
CAP PHASE SHIFT
REC
PB
PB INST
OVERLAP 1 COUNTER
To IC 102-2
FF
OVERLAP 2 COUNTER
To IC 102-3
MS5 V PULSE ON From MECHACON
1/3
3H or 9H
V PULSE WIDTH COUNTER
V PULSE To MECHACON
DRUM FG COUNTER
PULSE GEN
To IC 102-4
DRUM PG COUNTER
PB SW MM
Q107
ES
MS5 V PULSE ON From MECHACON
R108 PB SWITCHING POINT
From Q106 CAP REV
REV
SW1
CH1
SW2
DRUM F/V CONV
CLAMP
Q103
MS5 V PULSE ON From MECHACON
TP105 DRUM P/D
X2
1/N
SEARCH
1/3
SP
EP
CAP F/V CONV
PAUSE From MECHACON
MS8
ES
Q110
R126~R128
ATT
ASB ON
1/3
1/M
CAP F/V COUNTER
REV
FWD
1/N
SEARCH
REC
SEARCH
PB
CAP PHASE DETECTOR
TP104 CAP P/D
ACTIVE FILTER
R168,C128,C129
C105
R120
X101
R121
C104
FSC
PWM GEN
CLOCK BIT PATTERN
REC CTL COUNTER
L
H
PRESET
REC
PB
TK PRESET (from JIG UNIT)
REC ON
TRACKING MM
R101 TRACKING VR
R103 TRACKING PRESET
IC 106
To IC 103-6
TP103 CTL DELAY MMV
DRUM FF
TP111 DRUM FF
From IC 101-12
From IC 101-13
From IC 101-20
OV 1
OV 2
1/3 PG
IC 102
MS9 CAP M CTL REF
MS6 CAP CTL
From MECHACON
ACTIVE FILTER
R154 C121,C122
R152
SP/EP
Q111
ES
MS4 EP/SP From MECHACON
From MECHACON CAP CTL MS8
Q122
ES
Q121
ES
Q129
ES
Q112
ES
MS8 PAUSE From MECHACON
SW LOGIC
PB
REC FF
CONTROL DELAY MMV
MA
MI
MRR
MS3 MODE A
MS2 MODE I
From MECHACON
TP109 TP FM
Q139
EF
CN31
TP FM
From/To 0 3 PRE/REC CN 1
CN12
TP FM
To JIG UNIT
Q301~Q303 FE HEAD CTL
MS17 FE HEAD ON
From 0 1 MECHACON
TP301 FE 1
CN71
FLYING ERASE HEAD
DC/DC CONV
CAPSTAN REG
DRUM REG
MS SWD 8V
MS REG 9.6V
From 0 1 MECHACON
To 0 3 DRUM MDA CN254
CN22
DRUM M POWER
DRUM MP ERROR
TP101 MODE 1
CN31
MODE 1
MODE 2
MODE 3
MODE 4
To 0 3 PRE/REC CN 1
MODE 1 MS2
MODE A MS3
From MECHACON
D107
Q134
ES
MODE CTL Q136~Q138
Q133
ES
D106
Q131
AMP
CN21
CTL ERASE HEAD
R501 REC COLOR LEVEL
MS15 CTL ERASE
MS16 V REC
MS25 COLOR
From 0 1 MECHACON
Q501
AMP
CN31
REC COLOR
To 0 3 PRE/REC CN 1
A
B
C
D
E
F
G
H
1
2
3
4
5

4.6 POWER SYSTEM BLOCK DIAGRAM

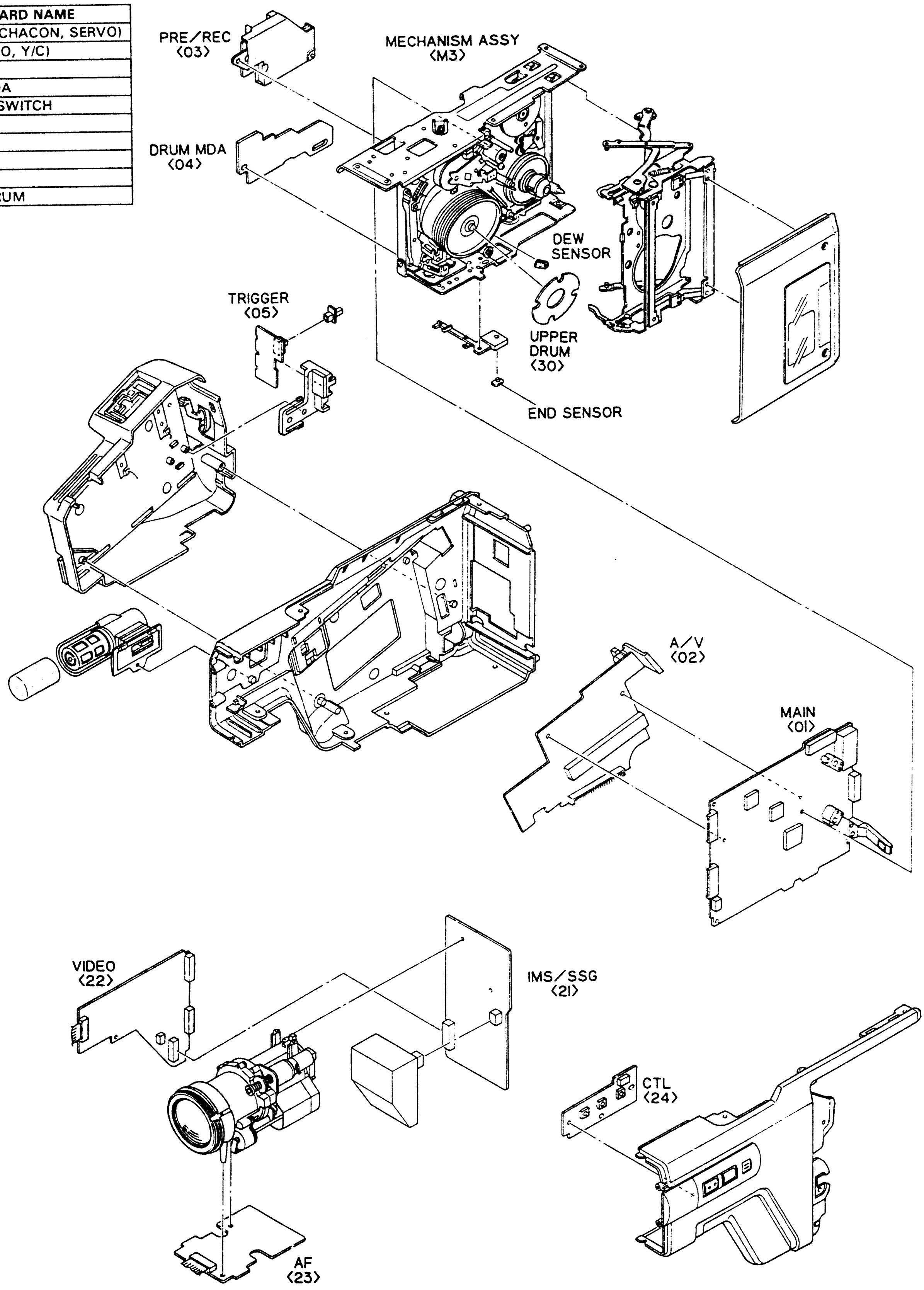


04 DRUM MDA
DROM MOTOR
CN252
IC 251 BA6452F
CN251
DRUM M. POWER
CN22
J1 DC JACK
CN11
F1
D11
01 MAIN (MECHACON,SERVO)
CP 14
CN 62
UNREG 9.6V
SWD 8V
SWD 5.2V
SERVO
IC 102 M51799FP
IC 104 BA10358F
IC 101 BU3777K
IC 103 M52410FP
IC 105 VC5026G
IC 106 BU4011BF
Q Q Q 125 126 127
CN 23
CAPSTAN MOTOR
SERVO DC/DC CONVERTER
L11
CP 13
CAPSTAN POWER OUT
MECHACON
IC 402 M54543ASL
CP 12
MODE CTL MOTOR DRIVE
IC 403 BU4583BF
IC 405 S-81252HG
CP 11
IC 406 S-8054HN
IC 401 VC2088
IC 602 TC7S08F
Q409 Q408 Q407
V REC
REC 8V
PB 5V
SERVO
Q301 Q302 Q303
L302
FLYING ERASE CTL
CN31
CN2
IC 1 M51499FP
L4
L5
L6
03 PRE/REC
IC 602 UPD 4538BG
A.D BOARD
CN 51
CN1
IC 1 UPD75008GB
IC 2 UPD6145G
OPERATION
CN2
02 A/V (AUDIO,Y/C)
-AUDIO-
CN32
CN2
SWD 5.2V
UNREG 9.6V
SWD 8V
L302
IC 301 BA7751AF
IC 302 M5218FP
IC 303 M5218FP
IC 304 S-81250AG
-Y/C-
IC 105 H8D7046
L106
IC 106 MSM6964-3MS
L101
IC 101 BA7288K
IC 102 BA7131F
L118
IC 103 LA7316M
L119
IC 104 NJM2233AM
SW REG
DC/DC CONVERTER
CN2
+15V
+5V
+9V
-7V
CN1
CN-V1
CN-V2
21 IMS/SSG
CN-S1
L1
CN-S5 CCD SOCKET
L2
IC 2 TC9224F
L3
L4
L5
IC 3 TC6018AF
L6
L7
L8
L9
L10
IC 4 IR3P67A
L11
IC 5 UPC324G2
23 AF
CN2
UNREG 9.6V
+5V
CN-V5
L1
L2
IC 1 HA113475MP
IC 3 TA8409F
AF MOTOR
ZOOM MOTOR
IC 4 UPC319G2
L3
+5V
IC 5 HA118020MA
IC 7 UPD78C14AG -043
L6
L5
IC 8 MN12821 (QR)
IC 6 TC4S71F
CN5
LED (INF SENSOR)
L6
IC 4 UPC2371GH
IC 6 UPD4053BG
IC 1 HA118025MP
L5
IC 5 HA118056MP
IC 7 UPC324G2
IC 9 TC4S71F
IC 10 TC4S69F
IC 8 UPD74HC00G
L2
IC 2 MSM6864MS
L1
L4
L3
IC 3 MSM6868MS
22 VIDEO
CN1
CP
IC 1 AN2512S
IC 2 TR 3
L01
FBT
CRT
50 ELECTRICAL VIEWFINDER
A
B
C
D
E
F
G
H
1
2
3
4
5

SECTION 5
CHARTS AND DIAGRAMS

5.1 CIRCUIT BOARD LOCATIONS

No.	BOARD NAME
01	MAIN (MECHACON, SERVO)
02	A/V (AUDIO, Y/C)
03	PRE/REC
04	DRUM MDA
05	TRIGGER SWITCH
21	IMS/SSG
22	VIDEO
23	AF
24	CONTROL
30	UPPER DRUM


PRE/REC
<03>
MECHANISM ASSY
<M3>
DRUM MDA
<04>
DEW
SENSOR
TRIGGER
<05>
UPPER
DRUM
<30>
END SENSOR
A/V
<02>
MAIN
<01>
VIDEO
<22>
IMS/SSG
<21>
CTL
<24>
AF
<23>

5.2 SCHEMATIC DIAGRAM NOTES

1. ▨ parts are safety related parts. When replacing them, be sure to use the specified parts.

2. Voltage and waveform measurment condition

- **DECK**

Voltage: DC-measured with a digital voltmeter during recording (SP mode) and play back (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parenthesis.

Waveform:

VIDEO System; Measured with a color bar during recording (SP mode) and play back (SP mode) with alignment tape.

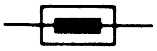
- **CAMERA**

Voltage/
Waveform: Measured from the gray scale pattern, which is lighted up brightly, and shot in the Rehersal mode.

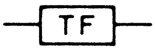
3. Unit indications

No units: [Ω]	No units: [μF]	No units : [μH]
K: [kΩ]	P: [pF]	m: [mH]
M: [MΩ]		

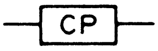
Thermistor



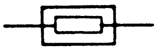
Thermal Fuse

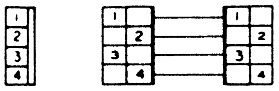


Circuit Protector

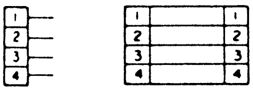


Posistor

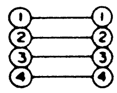




: Connector



: Board in connector

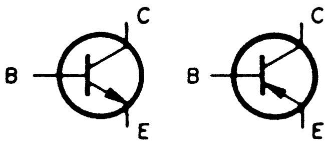


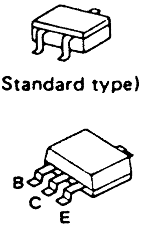
: Direct connection

COUNT UP : Active only at high.
$\overline{\text{COUNT DOWN}}$: Active only at low.

(YA) : Connected pattern in the board.
Abbreviations
(MS) Y : Y/C M : Mechacon
(SM) S : Servo A : Audio
MS : Signal flow from mechacon to servo.

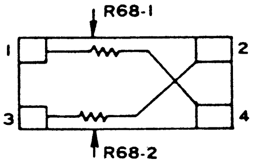
4. Chip transistor





5. Double chip resistors

These devices contain two resistance elements of differing values. In the example shown in the figure, R68 is comprised of R68-1 between terminals 1 and 4, and R68-2 between terminals 2 and 3.

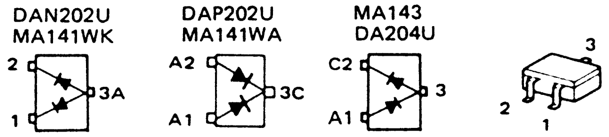


R68 PU59735-472Y103

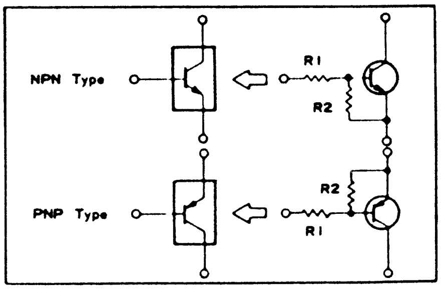
472 indicates 4.7 kΩ for R68-1
103 indicates 10 kΩ for R68-2

As can be noted from the figure, left-right reversal of the device does not change the connection values. However, turning the device upside-down will result in incorrected connection.

6. Chip diode



7. Digital transistor



RESISTOR VALUES

JUNCTION	TYPE	R1 (kΩ)	R2 (kΩ)
PNP	DTA124EU	22	22
NPN	DTC144EU DTC124EU	47 22	47 22

Note: The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

USES: INVERTER, INTERFACE, DRIVER CIRCUITS.

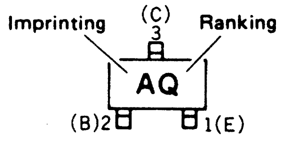
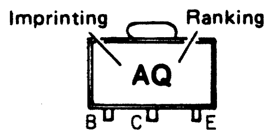
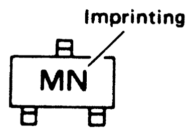
8. Definition of the surface and the back of circuit board diagrams
Front: Side on which discrete parts are assembled
Rear: Side on which chip parts are assembled

5.3 REPLACING SUBMINIATURE "CHIP" PARTS

1. Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
2. Additional compactness is achieved by using subminiature chip parts for certain circuit elements. When replacing these parts, note the cautions outlined below.

   Chip transistors and diodes used in this model are outlined as follows.
3. Chip transistors and diodes used in this model are outlined bellow.
4. Refer to parts list for correct part numbers.

- **Chip transistor and chip diode imprinting**

Transistors				Diodes	
Type	Imprinting	Type	Imprinting	Type	Imprinting
DTA124EU	15	2SB798	DM, DL, DK	DAN202U	N
DTC124EU	25	2SC2412K(S)	BS	DAP202U	P
DTC144EU	26	2SC3931	UB~UD	DA204U	D14
DTC144WU	86	2SC3936(BC)	KB, KC	FMN1	N1
FMC2	C2	2SC4081	BQ~QS	IMN10	N10
FMG1	G1	2SC4098(PQ)	AP, AQ	MA141WA	MN
FMG2	G2	2SC4099(NP)	JN, JP	MA141WK	MT
FMU1	U1	2SC4176	B33, B34, B35	MA143	MC
FMW1	W1	2SC4177(56)	L5, L6	MA3075H	7.5H
FMW3	W3	2SC4178(34)	F13, F14	MA704	MIK
2SA1036K	HP~HR	2SD1819	YQ~YS	MA716	M1U
2SA1532(BC)	EB, EC	2SJ146	4D	RD7.5M-T1B2	752
2SA1576	FQ, FR	2SK198P,Q	10P, 10Q	RD7.5MB3	753
2SA1610	Y33, Y34	2SK620	3N	RD8.2MB2	822
2SA1611(56)	M5, M6	2SK665	30		
2SB1218(RS)	AR, AS	3SK179	V03		
2SB624	BV4, BV5				
					

Note ; (   ) refers to Transistor rank.

5.4 KEY TO ABBREVIATIONS

A
AC : Alternating Current
ACC : Automatic Color Control
A/CTL : Audio/Control
ADC : Analog to Digital Converter
ADD : Adder
ADJ : Adjustment
AE : Audio Erase
AEF : Automatic Editing Function
AF : Auto Focus
AFC : Automatic Frequency Control
AFT : Automatic Fine Tuning
AGC : Automatic Gain Control
AH : Audio Head
AL : After Loading, Allways
ALC : Automatic Light Compensation
Automatic Level Control
ALM : Alarm
ALU : Arithmetic Logic Unit
AM : Amplitude Modulation
AMP : Amplifier
ANT : Antenna
APC : Automatic Pedestal Control
Automatic Phase Control
APL : Average Picture Level
A S M : Audio/Servo/Mechacon
ASS'Y : Assembly
ATT : Attenuator
AUD : Audio
AUTO : Automatic
AUX : Auxiliary

B
B : Base, Blue
BAL : Balance
BATT : Battery
BBD : Bucket Brigade Device
BCD : Binary Coded Decimal
BEG : Beginning
BF : Behind Focus
BFP : Burst Flag Pulse
BPF : Band Pass Filter
BIT : Binary Digit
BLK : Black, Blanking
BLU : Blue
BNC : Bayonet Connector
BOT : Beginning of Tape
BPF : Bandpass Filter
BRK : Brake
BRN : Brown
BRT : Brightness
BT : Band Tuning
BUFF : Buffer
BW or B/W : Black and White

C
C : Capacitance, Collector, Color, Character
CA : Camera
CAL : Calibration
CAP : Capstan, Capacitor
CAR : Carrier
CARR : Carrier
CASS : Cassette
CC : Cassette Compartment
CCD : Charge Coupled Device
CCT : Circuit
CdS : Cadmium Sulphide
CD : Count Down
CE : Chip Enable
CF : Ceramic Filter, Color Frame, Correct Focus
CH : Channel
CHG : Charge
CHROMA : Chrominance
CLK : Clock
CLR : Clear
CMD : Command
CMOS : Complementary Metal Oxide
Semiconductor
CNT : Count, Counter
COL : Color
COM : Common
COMB : Combination
Comb Filter
COMP : Comparator
Composite
Compensation
CONN : Connector
CONV : Converter
CP : Circuit Protector
Clamp Pulse
CPC : Capstan Phase Control
CPU : Central Processing Unit
CTC : Crosstalk Cancel
CTL : Control

D
D : Drum, Digital, Diode, Drain
DAC : Digital to Analog Converter
dB : Decibel
DC : Direct Current
DD : Direct Drive
DEC : Decoder
DEMOD : Demodulator
DEMUX : Demultiplexer
DET : Detector
DEV : Deviation
DFRS : Drum Free Running Stop
DG : Differential Gain
DIF : Differential
DISCR : Discriminator
DL : Delay Line
DOC : Dropout Compensator
DOD : Drop Out Detector
DP : Differential Phase
DPC : Drum Phase Control
DYAC : Dynamic Aperture Control

E
E : Edit, Emitter
EDP : Electronic Data Processing
E-E : Electric to Electric
EF : Emitter-Follower
EMP : Emphasis
EN : Enable
ENC : Encoder
ENV : Envelope
EOT : End of Tape
EP : Extended Play
EQ : Equalizer
ES : Electronic Switch
ESNS : End Sensor
EXP : Expander
EXT : External

F
F : Farad, Fuse
F ADV : Frame Advance
FDP : Fluorescent Display Panel
FE : Full Erase
FET : Field Effect Transistor
FF : Fast Forward, Front Focus
Flipflop
FG : Frequency Generator
FM : Frequency Modulation
FR : Full Recording, Frame, Fusible Resistor
FREQ : Frequency
F-V CONV : Frequency to Voltage Converter
FWD : Forward
FWD S : Forward Search

G
G : Green, Gate, Grid
GEN : Generator
GND : Ground
GRN : Green
GRY : Gray

H
H : High, Henry, Hour
HBF : Horizontal Burst Flag
HD : Horizontal Drive
HPF : Highpass Filter
Hz : Herz

I
IC : Integrated Circuit
ID : Identification (Pulse)
IF : Intermediate Frequency
IFR : Infrared
IFT : Intermediate Frequency Transformer
IND : Indicator
INH : Inhibit
INS : Insert
INT : Internal, Interrupt
INV : Inverter, Interleave
I/O : Input/Output
IR : Infrared

L
L : Low, Left
LCD : Liquid Crystal Display
LED : Light Emitting Diode
LIM : Limiter
LIN : Linearity
LLD : Low Light Detector
LOAD : Loading (Cassette)
LP : Long Play
LPF : Lowpass Filter
LSB : Lower Sideband

M
M : Motor, Mega
MAX : Maximum
MDA : Motor Drive Amplifier
MECHACON : Mechanism Control
MIC : Microphone
MIN : Minimum
MIX : Mixer, Mixing
MMV : Monostable Multivibrator
MNOS : Metal Nitride Oxide Semiconductor
MOD : Modulation, Modulator
MODEM : Modulator-Demodulator
MON : Monitor
MOS : Metal Oxide Semiconductor
MPX : Multiplexer, Multiplex
MS : Mode Select
MUT : Muting

N
NAND : Not-And
NC : Not Connected, Normally Closed
NFB : Negative Feedback
NLN : Non-Linear
NO : Normally Open
NOR : Normal, Not-Or
NR : Noise Reduction

O
OP : Operation
OPAMP : Operational Amplifier
ORG : Orange
OSC : Oscillator

P
PB : Playback
PC : Photocoupler, Pulse Counter
PCM : Pulse Code Modulation
PG : Pulse Generator
PGM : Program
PI : Photo Interrupter
PIC : Picture Control
PIF : Picture Intermediate Frequency
PLA : Programmable Logic Array
PLL : Phase Locked Loop
PNK : Pink
POS : Position
p-p : Peak-to-Peak
PR : Pinch Roller
PREAMP : Preamplifier
PRL : Preroll
P/S : Pause/Still
PSC : Pulse Swallowing Control
PU : Pickup
PUT : Programmable Unijunction Transistor
PWB : Printed Wiring Board
PWM : Pulse Width Modulation
PWR : Power

Q
Q : Quality Factor

R
R : Red, Right
RA : Resistor Array
RAM : Random Access Memory
REC : Recording
REF : Reference
REG : Regulated, Regulator
REM : Remote
REMOCON : Remote Control (Unit)
REV : Reverse
REV S : Reverse Search
REW : Rewind
RF : Radio Frequency
ROM : Read Only Memory
R/P : Record/Playback
RPT : Repeat
RS FF : RS Flipflop
RST : Reset
RT : Rotary Transformer
RUN : Running
RY : Relay

S
SAW : Sawtooth, Surface Acoustic Wave
SC : Subcarrier, Simulcast
SCH : Search
SEL : Select, Selector
SENS : Sensor
SEP : Separator
SF : Source Follower
SFF : Short Fast Forward
SIF : Sound Intermediate Frequency
SN : Signal to Noise Ratio
SOL : Solenoid
SOS : Sound on Sound
SP : Standard Play
SR : Supply Reel
SREW : Short Rewind
S/S : Slow/Still
SSG : Sync Signal Generator
SSNS : Start Sensor
STD : Strobe Data, Standard
SUP : Supply
SW : Switch
SWD : Switched
SYNC : Synchronization

T
TAL : Tally
TBC : Time Base Corrector
TC : Tension Control, Time Code
TEN : Tension
TF : Thermal Fuse
TIM : Timing
TK : Tracking
TNR : Tuner
TP : Test Point
TPZD : Trapezoid
TR : Transistor, Trimmer
TRANS : Transformer
TU : Take-up

U
UL : Unloading
UNREG : Unregulated
UNSW : Unswitched

V
V : Vertical, Volt
VACT : Video Action
VCO : Voltage Controlled Oscillator
VD : Vertical Drive
VIF : Video Intermediate Frequency
VLT : Violet
VR : Variable Resistor
VS : Video and Sync
VSCH : Variable Search
VV : Video to Video
VXO : Variable Crystal Oscillator

W
W : Watt
WARN : Warning
W & D : White and Dark
WHT : White
WV : Working Voltage

X
XTAL : Crystal

Y
Y : Luminance
YEL : Yellow

5.5 SEMICONDUCTOR SHAPES

NAME		L
IC		
B	BA10358F	7A
	BA6452F	7C
	BA7131F	1A
	BA7288K	4A
	BA7751AF	7C
	BU3777K	4A
	BU4011BF	1B
	BU4584BF	1B
H	HA118020MA	8A
	HA118025MP	8A
	HA118056MP	3B
	HA13475MP	7B
	H8D7046	4C
I	IR3P67A	2B
L	LA7316M	7C
M	MN12821(QR)	3A
	MSM6865MS	1A
	MSM6869MS	1A
	MSM6965-3MS	1A
	M51799FP	5A
	M52053FP	5C
	M5218FP	1A
	M52410FP	6A
	M54543ASL	5B
N	NJM2233AM	1A
S	S-8054HN	4B
	S-81250AG	2A
	S-81252HG	2A
T	TA8409F	2C
	TC4S69F	3C
	TC4S71F	3C
	TC4S81F	8B
	TC6S12F	6B

NAME		L
	TC6018AF	6B
	TC7S08F	8B
	TC9224F	6A
U	UPC2371GH	1C
	UPC319G2	1B
	UPC324G2	1B
	UPD4024BG	1B
	UPD4053BG	5C
	UPD4538BG	5C
	UPD74HC00G	1B
	UPD74HC04G	5C
	UPD78C14AG-043	6C
V	VC2088	6B
	VC5026G	6A
TRANSISTOR		
D	DTA114EU	1D
	DTA143EU	1D
	DTA144EU	1D
	DTC114EK	3D
	DTC114EU	1D
	DTC144ES	3D
	DTC144EU	1D
	DTC144WU	1D
F	FMC3	7D
	FMQ1	8D
	FMU1	6D
	FMW3	5D
2SA	2SA1532	1D
	2SA1576	1D
	2SA1577	1D
2SB	2SB624	1D
	2SB798	4D
2SC	2SC2778C	1D
	2SC3936	1D
	2SC4081	1D
	2SC4102	1D
	2SC4117	1D

NAME		L
2SD	2SD1819	1D
	2SD596	1D
2SK	2SK665	2D
DIODE		
D	DAN202U	1E
	DA204U	5E
E	ERA81-004	3E
M	MA141A	2E
	MA141K	4E
	MA141WA	2E
	MA141WK	1E
	MA704	4E
R	RB451F	4D
	RD6.1EB1	4D
	1SS133	4E

	IC			TRANSISTOR	DIODE
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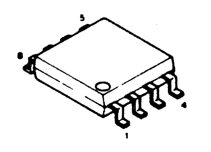
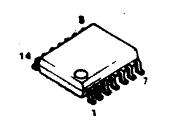
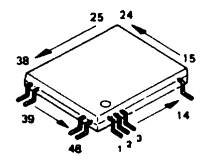
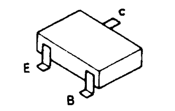
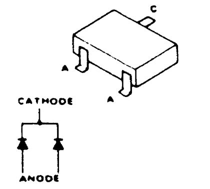
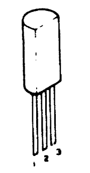
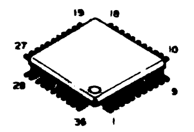
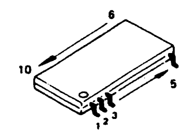
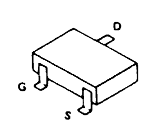
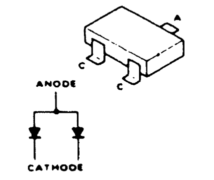
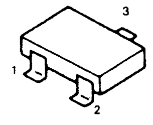
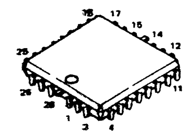
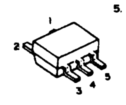
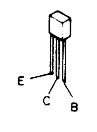
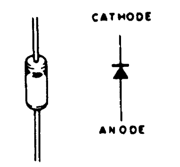
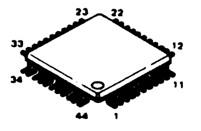
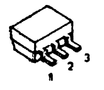
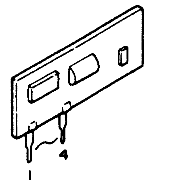
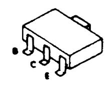
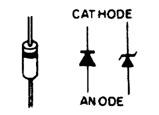
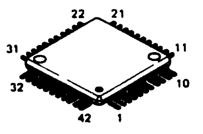
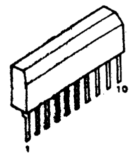
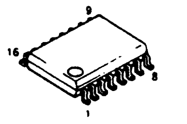
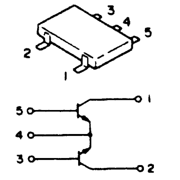
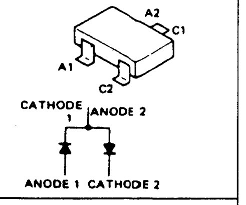
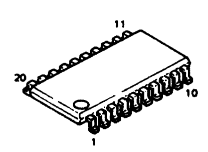
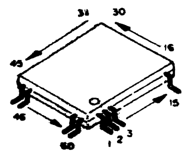
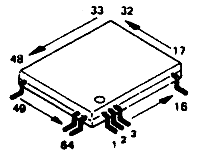
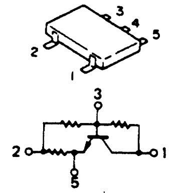
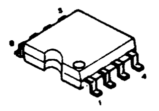
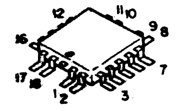
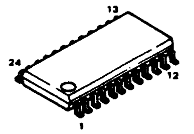
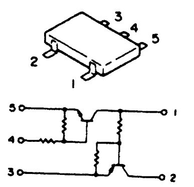
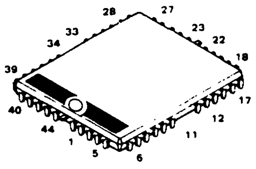
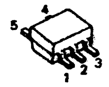
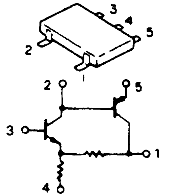
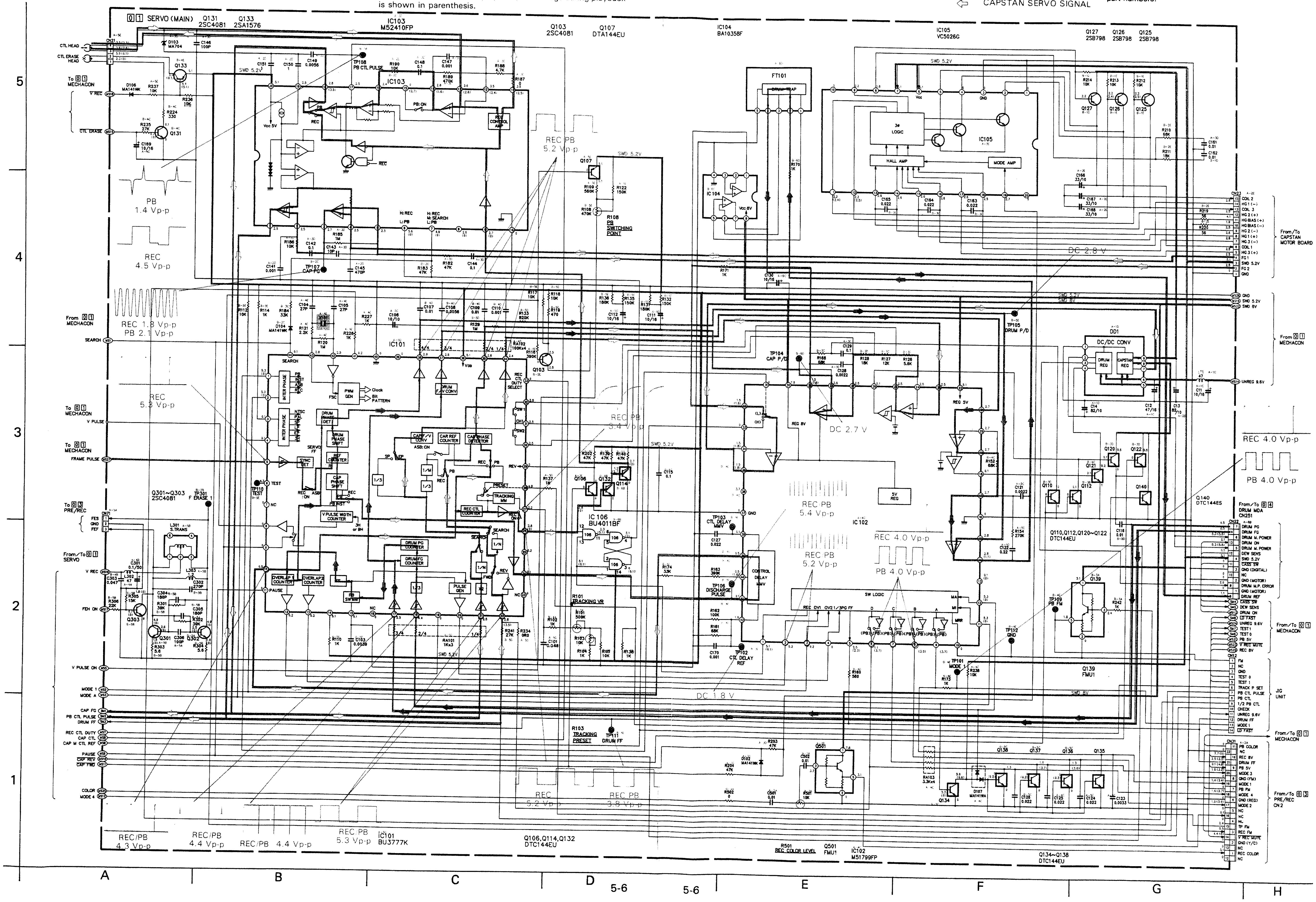
1					
2					
3			 1. OUT 2. Vcc 3. IN 4. IN 5. GND		
4					
5					
6					
7					
8		 1. IN 2. IN 3. GND 4. OUT 5. Vcc			

5.6 SERVO SCHEMATIC DIAGRAM

- Voltage : DC-measured with a digital voltmeter during recording (SP mode) and play back (SP mode) with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.
- Waveform : Measured with a color bar during recording (SP mode) and play back (SP mode) with alignment tape.
- SIGNAL PATH
  - ⬅ DRUM SERVO SIGNAL
  - ⇦ CAPSTAN SERVO SIGNAL
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

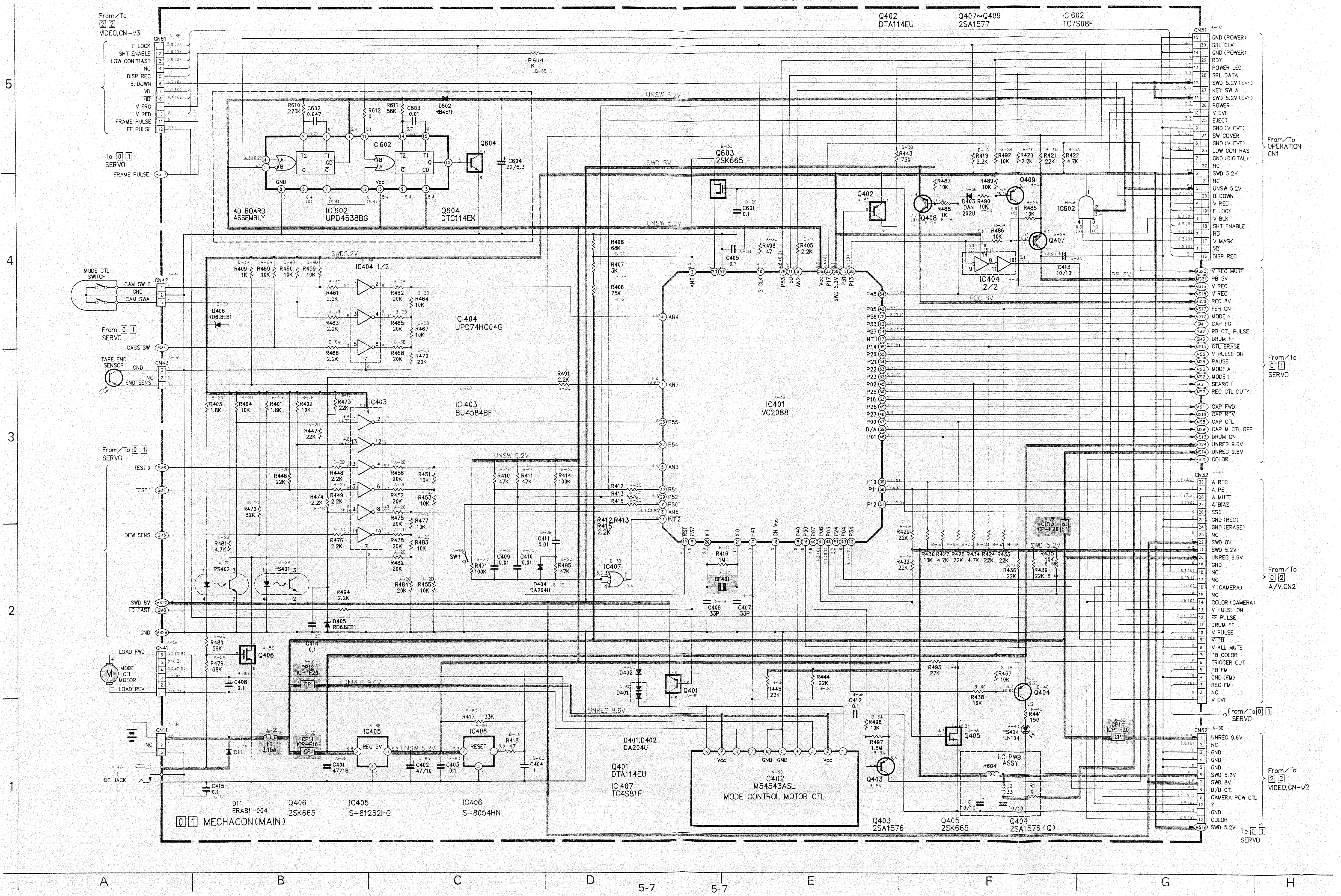


01 SERVO (MAIN)
Q131 2SC4081
Q133 2SA1576
IC103 M52410FP
Q103 2SC4081
Q107 DTA144EU
IC104 BA10358F
IC105 VC5026G
Q127 2SB798
Q126 2SB798
Q125 2SB798
CTL HEAD
CTL ERASE HEAD
To 01 MECHACON
V REC
CTL ERASE
TP108 PB CTL PULSE
PB 1.4 Vp-p
REC 4.5 Vp-p
REC PB 5.2 Vp-p
R108 PB SWITCHING POINT
FT101 DRUM TRAP
3φ LOGIC
HALL AMP
MODE AMP
From/To CAPSTAN MOTOR BOARD
DC 2.8 V
TP107 CAP-FG
From 01 MECHACON
SEARCH
REC 1.8 Vp-p
PB 2.1 Vp-p
IC101
TP105 DRUM P/D
DD1 DC/DC CONV
DRUM REG
CAPSTAN REG
UNREG 9.6V
TP104 CAP P/D
DC 2.7 V
REG 5V
REC 5.3 Vp-p
To 01 MECHACON
V PULSE
FRAME PULSE
REC PB 3.4 Vp-p
REC 4.0 Vp-p
PB 4.0 Vp-p
Q301~Q303 2SC4081
TP301 F ERASE 1
TP110 TEST
IC106 BU4011BF
TP103 CTL DELAY MMV
REC PB 5.4 Vp-p
IC102
Q140 DTC144ES
From/To 04 DRUM MDA CN251
To 03 PRE/REC
L301 S.TRANS
REC PB 5.2 Vp-p
REC 4.0 Vp-p
PB 4.0 Vp-p
Q110,Q112,Q120~Q122 DTC144EU
From/To 01 SERVO
TP106 DISCHARGE PULSE
SW LOGIC
TP109 PB FM
Q139
R101 TRACKING VR
TP112 GND
TP102 CTL DELAY REF
TP101 MODE 1
Q139 FMU1
From/To 01 MECHACON
V PULSE ON
MODE 1
MODE A
CAP FG
PB CTL PULSE
DRUM FF
REC CTL DUTY
CAP CTL
CAP M CTL REF
PAUSE
CAP REV
CAP FWD
COLOR
MODE 4
DC 1.8 V
SWD 8V
JIG UNIT
From/To 01 MECHACON
R103 TRACKING PRESET
TP111 DRUM FF
Q501
Q138
Q137
Q136
Q135
Q134
From/To 03 PRE/REC CN2
REC 5.2 Vp-p
REC PB 3.8 Vp-p
REC/PB 4.3 Vp-p
REC/PB 4.4 Vp-p
REC/PB 4.4 Vp-p
REC PB 5.3 Vp-p
IC101 BU3777K
Q106,Q114,Q132 DTC144EU
R501 REC COLOR LEVEL
Q501 FMU1
IC102 M51799FP
Q134~Q138 DTC144EU
A
B
C
D
E
F
G
H
1
2
3
4
5

5.7 MECHACON SCHEMATIC DIAGRAM

- Voltage : DC-measured with a digital voltmeter during recording (SP mode) and play back (SP mode) with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

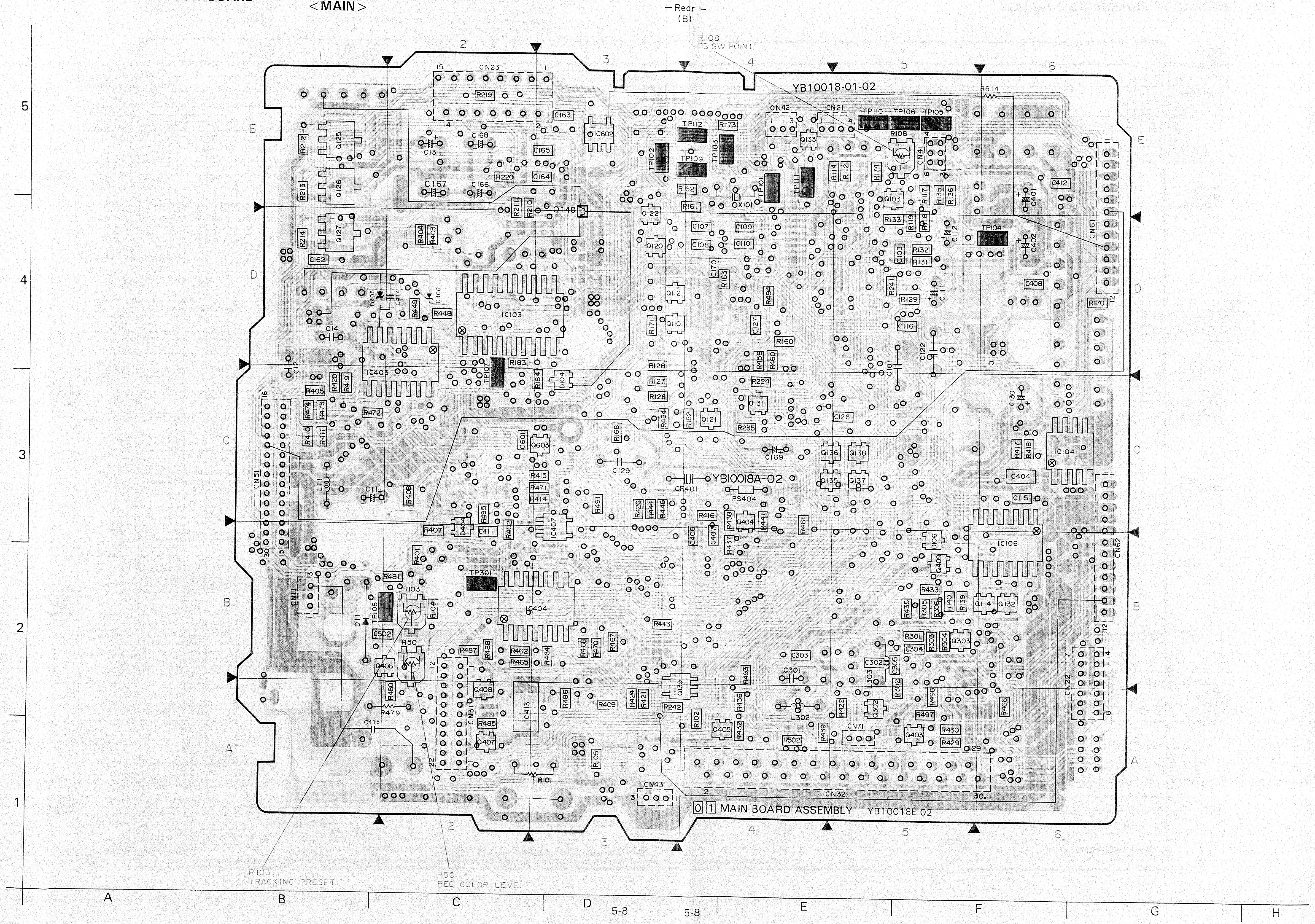
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.



From/To 22 VIDEO,CN-V3
CN61
F LOCK
SHT ENABLE
LOW CONTRAST
NC
DISP REC
B. DOWN
VD
HD
V FRG
V RED
FRAME PULSE
FF PULSE
To 01 SERVO
FRAME PULSE
AD BOARD ASSEMBLY
IC 602 UPD4538BG
Q604 DTC114EK
Q603 2SK665
Q402 DTA114EU
Q407~Q409 2SA1577
IC 602 TC7S08F
UNSW 5.2V
SWD 8V
SWD5.2V
MODE CTL SWITCH
CN42
CAM SW B
GND
CAM SWA
From 01 SERVO
CASS SW
TAPE END SENSOR
CN43
END SENS
IC 404 UPD74HC04G
IC 403 BU4584BF
IC401 VC2088
From/To 01 SERVO
TEST 0
TEST 1
DEW SENS
SWD 8V
LD FAST
GND
CN41
LOAD FWD
MODE CTL MOTOR
LOAD REV
CN11
NC
J1 DC JACK
F1 3.15A
CP11 ICP-F10
CP12 ICP-F20
CP13 ICP-F20
CP14 ICP-F20
UNREG 9.6V
IC405 REG 5V
IC406 RESET
D401,D402 DA204U
Q401 DTA114EU
IC 407 TC4S81F
IC402 M54543ASL MODE CONTROL MOTOR CTL
D11 ERA81-004
Q406 2SK665
IC405 S-81252HG
IC406 S-8054HN
Q403 2SA1576
Q405 2SK665
Q404 2SA1576 (Q)
LC PWB ASSY
01 MECHACON(MAIN)
CN51
GND (POWER)
SRL CLK
RDY
POWER LED
SRL DATA
SWD 5.2V (EVF)
KEY SW A
POWER
V EVF
EJECT
GND (V EVF)
SW COVER
GND (DIGITAL)
NC
SWD 5.2V
UNSW 5.2V
B. DOWN
V RED
F LOCK
V BLK
SHT ENABLE
HD
V MASK
VD
DISP REC
From/To OPERATION CN1
V REC MUTE
PB 5V
V REC
REC 8V
FEH ON
MODE 4
CAP FG
PB CTL PULSE
DRUM FF
CTL ERASE
V PULSE ON
PAUSE
MODE A
MODE 1
SEARCH
REC CTL DUTY
CAP FWD
CAP REV
CAP CTL
CAP M CTL REF
DRUM ON
UNREG 9.6V
COLOR
From/To 01 SERVO
CN32
A REC
A PB
A MUTE
A BIAS
SSC
GND (REC)
GND (ERASE)
SWD 8V
Y (CAMERA)
COLOR (CAMERA)
V PULSE ON
FF PULSE
DRUM FF
V PULSE
V PB
V ALL MUTE
PB COLOR
TRIGGER OUT
PB FM
GND (FM)
REC FM
V EVF
From/To 02 A/V,CN2
From/To 01 SERVO
CN62
D/D CTL
CAMERA POW CTL
Y
From/To 22 VIDEO,CN-V2
To 01 SERVO
A
B
C
D
E
F
G
H
1
2
3
4
5

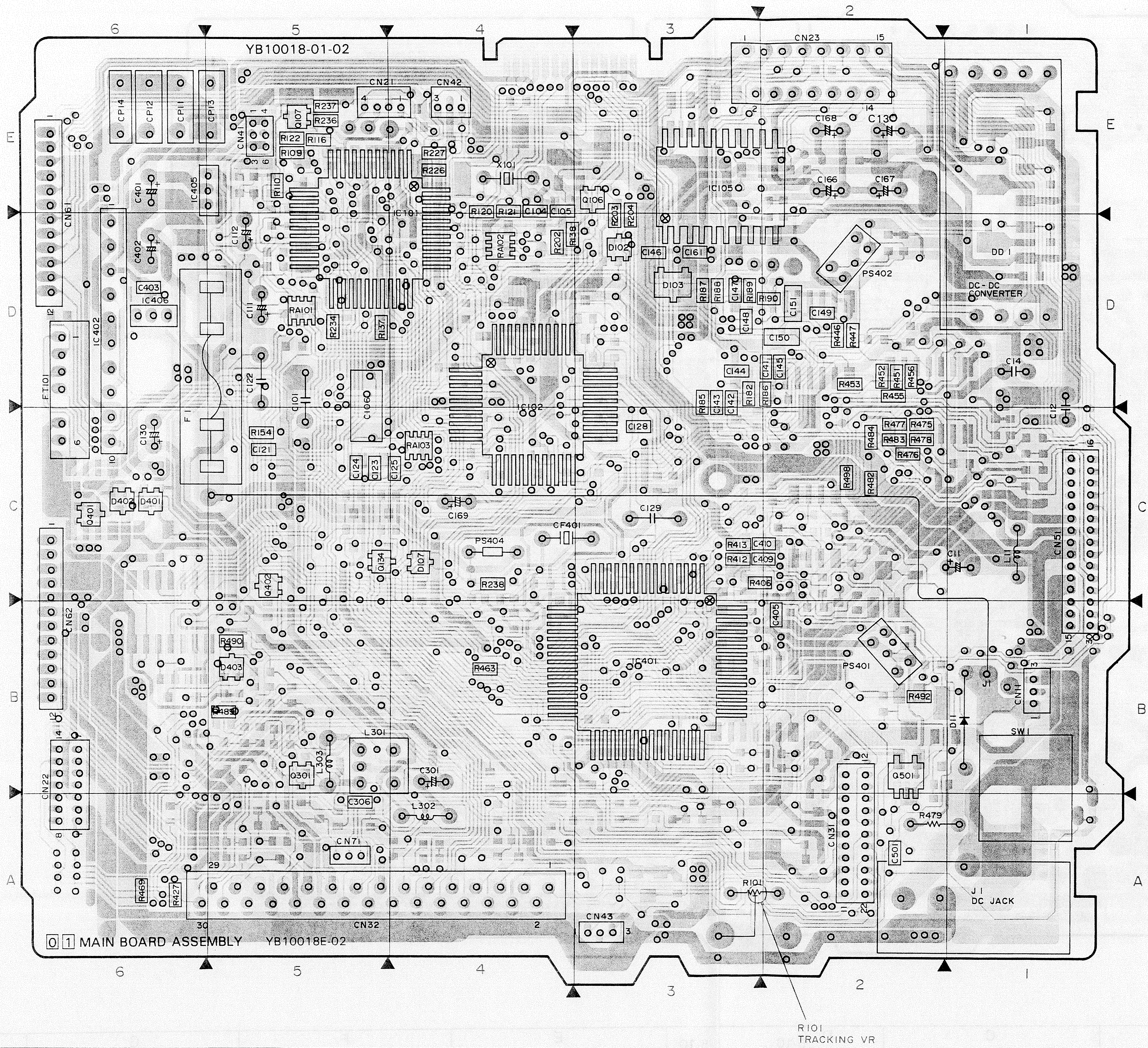
5.8 MAIN CIRCUIT BOARD

<MAIN>

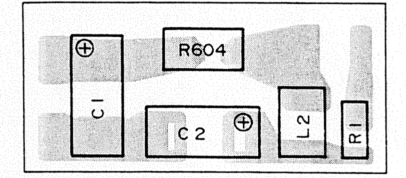

— Rear —
(B)
R108
PB SW POINT
YB10018-01-02
YB10018A-02
01 MAIN BOARD ASSEMBLY YB10018E-02
CN23
CN42
CN21
CN41
CN61
CN62
CN51
CN11
CN31
CN22
CN32
CN43
CN71
IC602
IC103
IC403
IC104
IC106
IC404
IC407
TP110
TP106
TP105
TP112
TP109
TP102
TP103
TP101
TP111
TP104
TP107
TP108
TP301
CF401
PS404
X101
R103
R501
R101
R614
1
2
3
4
5
6
A
B
C
D
E
F
G
H
R103
TRACKING PRESET
R501
REC COLOR LEVEL

<MAIN>

— Front —
(A)

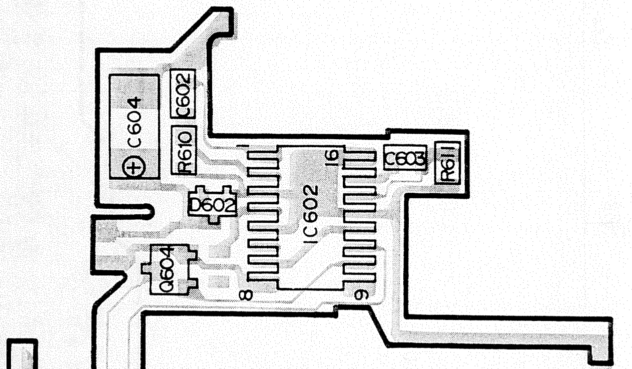

YB10018-01-02
6
5
4
3
2
1
E
D
C
B
A
CN23
CN21
CN42
CN41
CN61
CN62
CN22
CN32
CN43
CN71
CN31
CN51
CN11
CP14
CP12
CP11
CP13
IC101
IC102
IC105
IC106
IC401
IC402
IC405
IC406
X101
Q106
Q107
Q134
Q301
Q401
Q402
Q501
D102
D103
D107
D401
D402
D403
D11
DD1
DC-DC CONVERTER
PS401
PS402
PS404
CF401
RA101
RA102
RA103
FT101
F1
L301
L302
L303
L11
SW1
J1
DC JACK
C129
C301
C306
C501
R101
R479
R492
R463
R238
R490
R469
R427
01 MAIN BOARD ASSEMBLY
YB10018E-02
R101
TRACKING VR

<LC>


R604
C1
C2
L2
R1

YB30045A
LC BOARD ASSEMBLY

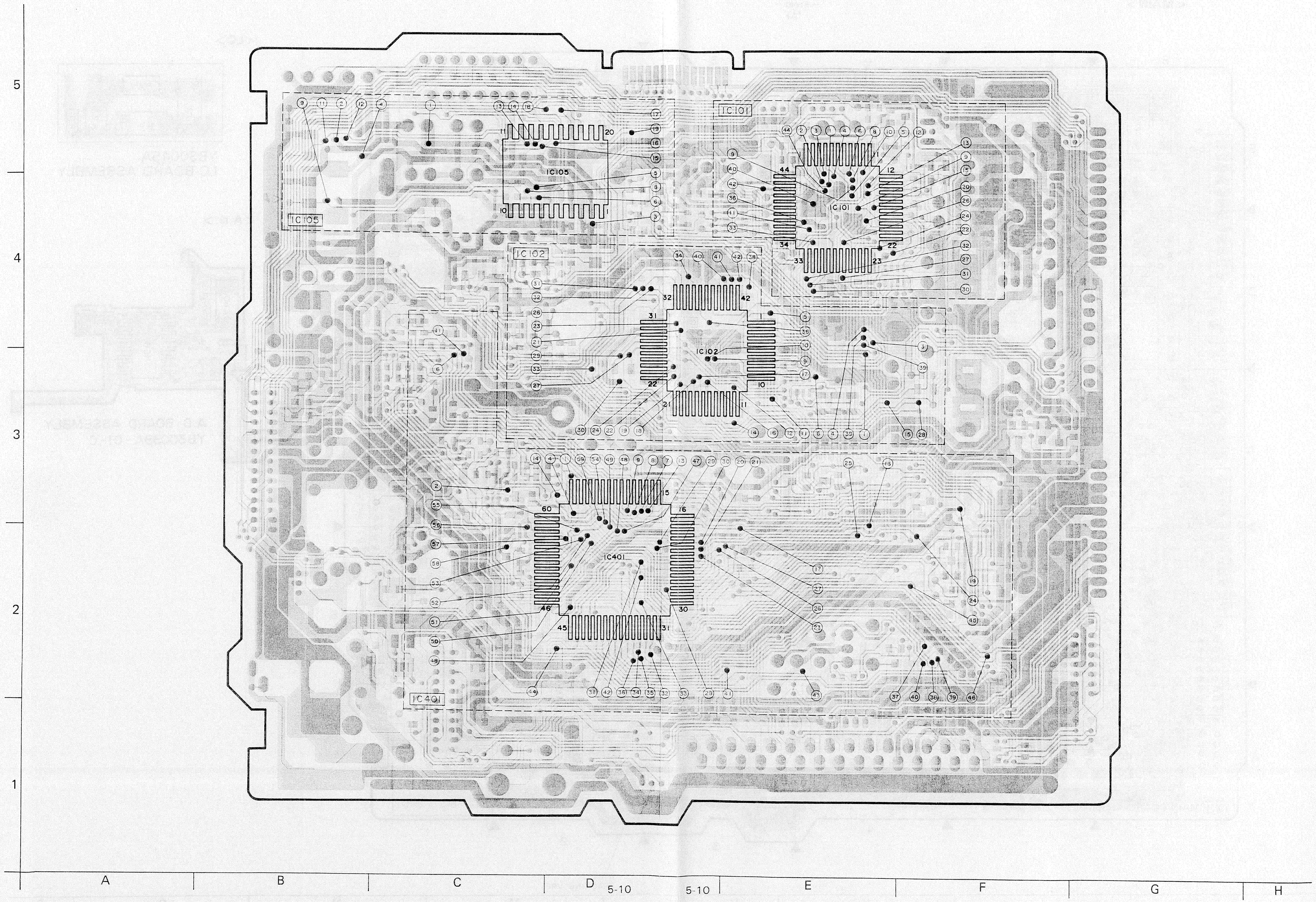
<A.D.>


C604
C602
R610
D602
IC602
C603
R611
Q604
R612
16
8
9

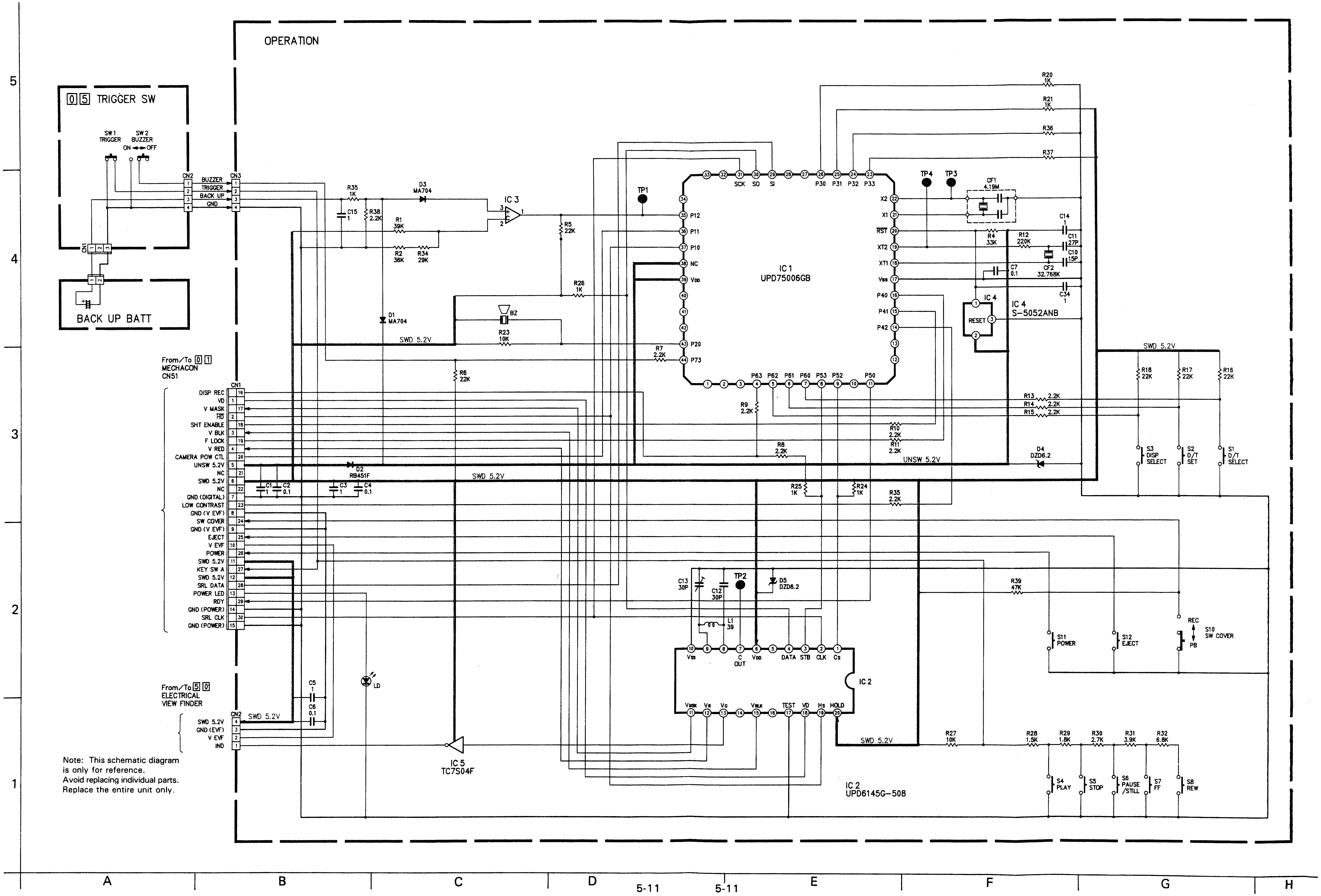
A.D BOARD ASSEMBLY
YB30039A-01-C

I | J | K | L | 5-9 | 5-9 | M | N | O | P

5.9 MAIN BOARD THROUGH HOLE LOCATION


5
4
3
2
1
A
B
C
D
E
F
G
H
IC105
IC101
IC102
IC401

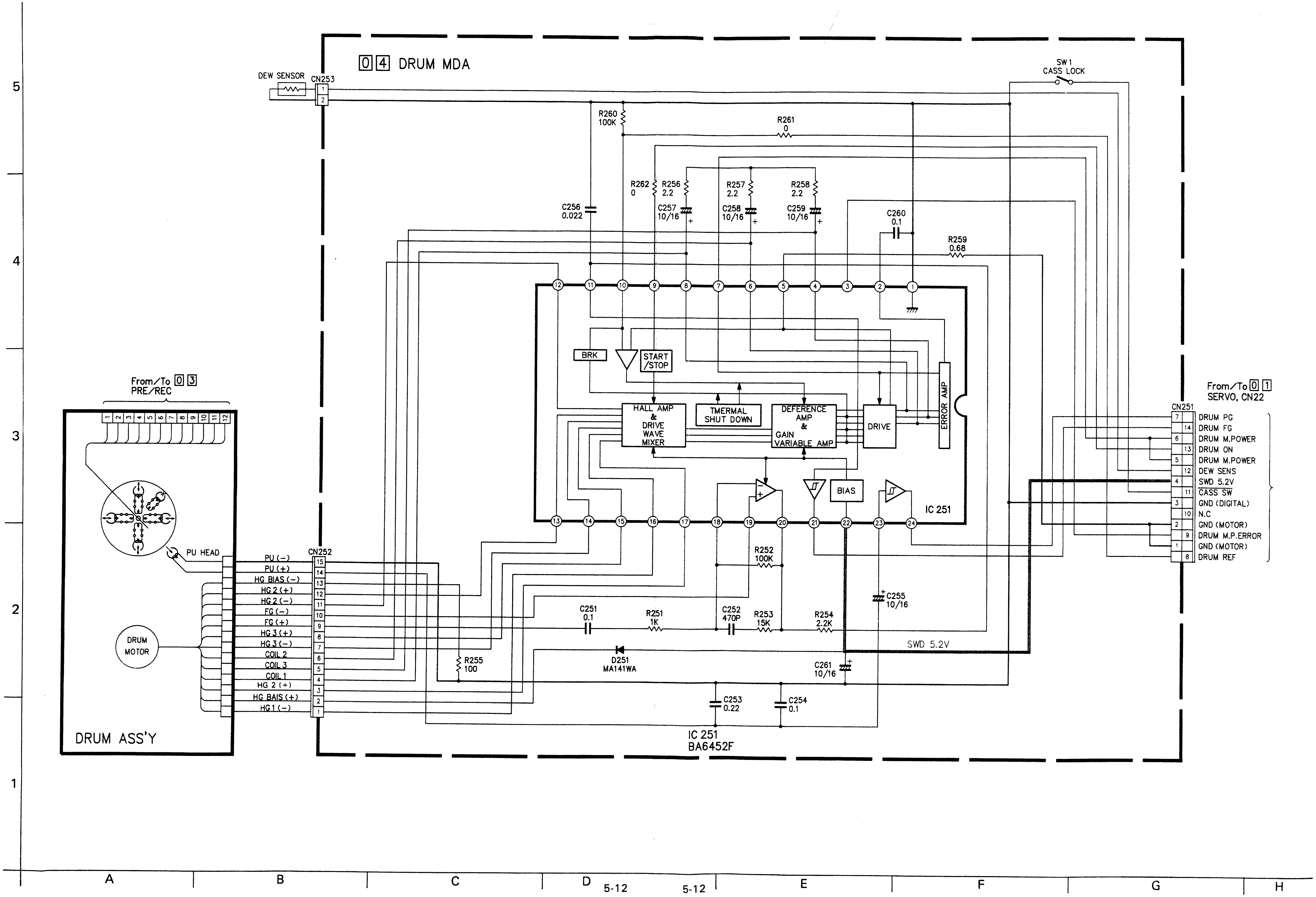
5.10 OPERATION AND TRIGGER SWITCH SCHEMATIC DIAGRAMS



OPERATION
05 TRIGGER SW
SW1 TRIGGER
SW2 BUZZER
ON ◄► OFF
CN2
BUZZER
TRIGGER
BACK UP
GND
CN3
CN1
BACK UP BATT
From/To 01 MECHACON CN51
DISP REC
VD
V MASK
FID
SHT ENABLE
V BLK
F LOCK
V RED
CAMERA POW CTL
UNSW 5.2V
NC
SWD 5.2V
NC
GND (DIGITAL)
LOW CONTRAST
GND (V EVF)
SW COVER
GND (V EVF)
EJECT
V EVF
POWER
SWD 5.2V
KEY SW A
SWD 5.2V
SRL DATA
POWER LED
RDY
GND (POWER)
SRL CLK
GND (POWER)
From/To 50 ELECTRICAL VIEW FINDER
SWD 5.2V
GND (EVF)
V EVF
IND
R35 1K
C15 1
R38 2.2K
D3 MA704
R1 39K
R2 36K
R34 29K
IC 3
D1 MA704
R5 22K
R26 1K
BZ
R23 10K
SWD 5.2V
R6 22K
R7 2.2K
D2 RB451F
C1 1
C2 0.1
C3 1
C4 0.1
SWD 5.2V
C5 1
C6 0.1
LD
IC 5 TC7S04F
TP1
IC 1 UPD75006GB
SCK SO SI
P30 P31 P32 P33
P12 P11 P10 NC VDD
P20 P73
P63 P62 P61 P60 P53 P52 P50
X2 X1 RST XT2 XT1 Vss P40 P41 P42
TP4 TP3
CF1 4.19M
R4 33K
R12 220K
C14 1
C11 27P
C10 15P
CF2 32.768K
C7 0.1
C34 1
IC 4 S-5052ANB
RESET
R20 1K
R21 1K
R36
R37
R9 2.2K
R8 2.2K
R10 2.2K
R11 2.2K
UNSW 5.2V
D4 DZD6.2
R13 2.2K
R14 2.2K
R15 2.2K
SWD 5.2V
R18 22K
R17 22K
R16 22K
S3 DISP SELECT
S2 D/T SET
S1 D/T SELECT
R25 1K
R24 1K
R35 2.2K
C13 30P
C12 30P
TP2
D5 DZD6.2
L1 39
Vss C OUT VDD DATA STB CLK Cs
IC 2
VMSK VR VC VBLK TEST VD HS HOLD
SWD 5.2V
IC 2 UPD6145G-508
R39 47K
S11 POWER
S12 EJECT
REC
PB
S10 SW COVER
R27 10K
R28 1.5K
R29 1.8K
R30 2.7K
R31 3.9K
R32 6.8K
S4 PLAY
S5 STOP
S6 PAUSE /STILL
S7 FF
S8 REW
5
4
3
2
1
A
B
C
D
E
F
G
H

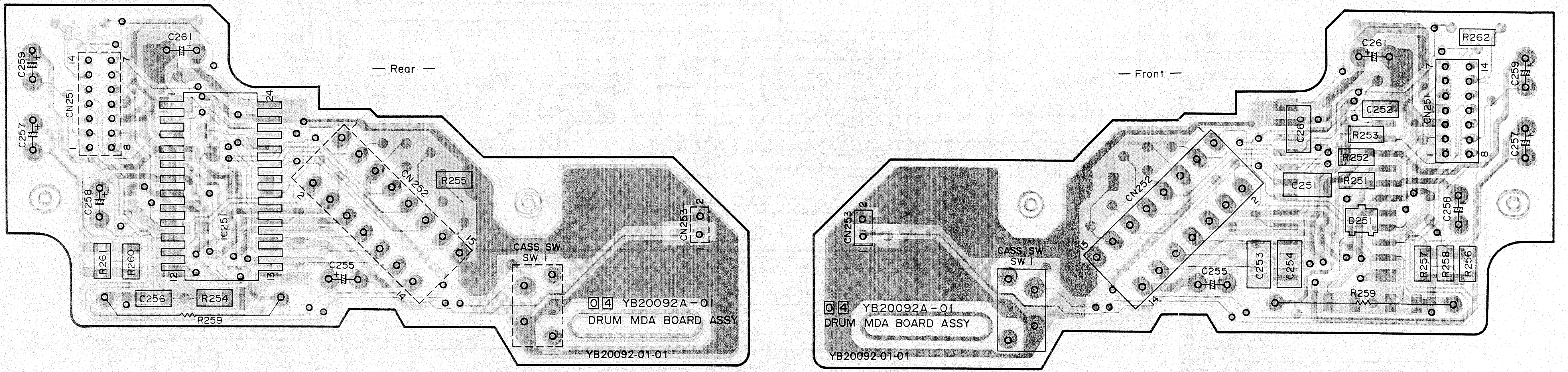
Note: This schematic diagram
is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

5.11 DRUM MDA SCHEMATIC DIAGRAM

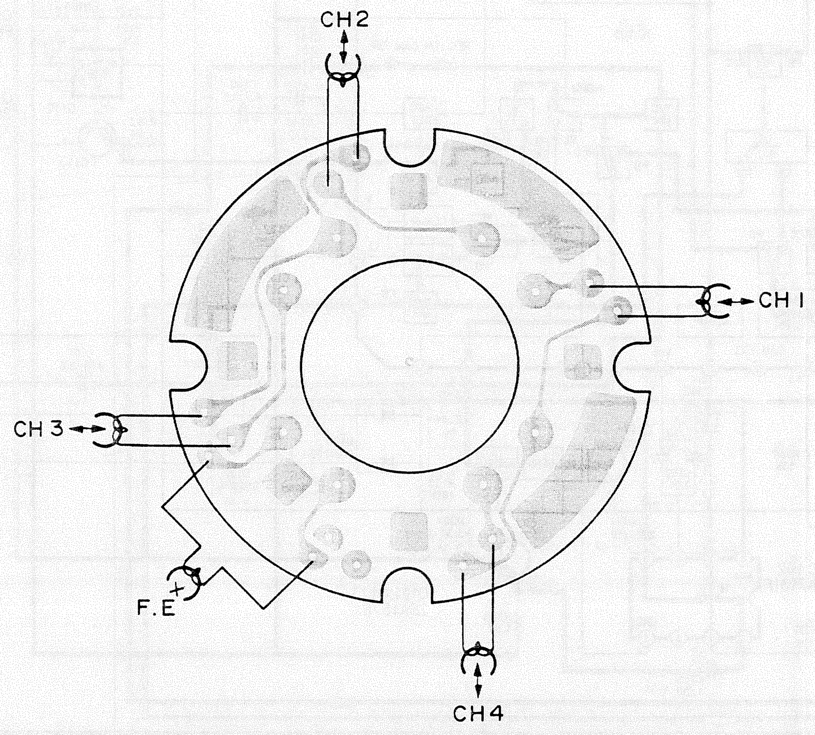

04 DRUM MDA
DEW SENSOR
CN253
SW1
CASS LOCK
R260 100K
R261 0
R262 0
R256 2.2
R257 2.2
R258 2.2
C256 0.022
C257 10/16
C258 10/16
C259 10/16
C260 0.1
R259 0.68
BRK
START /STOP
HALL AMP & DRIVE WAVE MIXER
TMERMAL SHUT DOWN
DEFERENCE AMP & GAIN VARIABLE AMP
DRIVE
ERROR AMP
BIAS
IC 251
R252 100K
C251 0.1
R251 1K
C252 470P
R253 15K
R254 2.2K
C255 10/16
SWD 5.2V
D251 MA141WA
C261 10/16
R255 100
C253 0.22
C254 0.1
IC 251 BA6452F
From/To 03 PRE/REC
DRUM ASS'Y
PU HEAD
DRUM MOTOR
CN252
15 PU (−)
14 PU (+)
13 HG BIAS (−)
12 HG 2 (+)
11 HG 2 (−)
10 FG (−)
9 FG (+)
8 HG 3 (+)
7 HG 3 (−)
6 COIL 2
5 COIL 3
4 COIL 1
3 HG 2 (+)
2 HG BAIS (+)
1 HG 1 (−)
From/To 01 SERVO, CN22
CN251
7 DRUM PG
14 DRUM FG
6 DRUM M.POWER
13 DRUM ON
5 DRUM M.POWER
12 DEW SENS
4 SWD 5.2V
11 CASS SW
3 GND (DIGITAL)
10 N.C
2 GND (MOTOR)
9 DRUM M.P.ERROR
1 GND (MOTOR)
8 DRUM REF
5
4
3
2
1
A
B
C
D
E
F
G
H

5.12 DRUM MDA, UPPER DRUM AND TRIGGER SWITCH CIRCUIT BOARDS

<DRUM MDA>

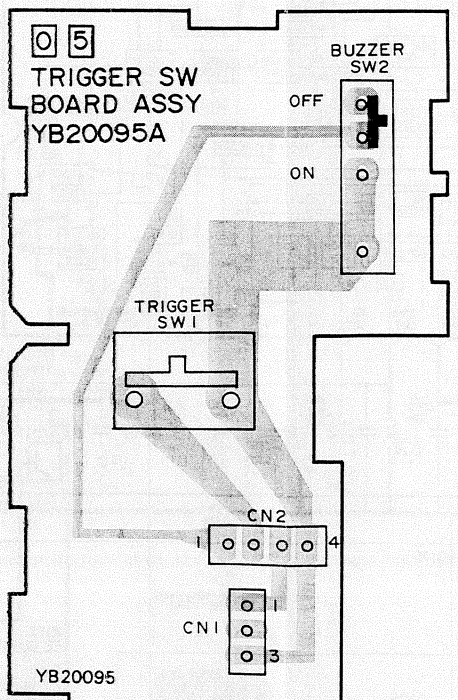

— Rear —
C261
C259
CN251
14
7
1
8
C257
24
C258
IC251
12
13
CN252
R255
R261
R260
C255
C256
R254
R259
CN253
CASS SW
SW 1
04 YB20092A-01
DRUM MDA BOARD ASSY
YB20092-01-01
— Front —
R262
C252
R253
R252
R251
C251
C260
D251
C253
C254
R257
R258
R256
15
14
2

<UPPER DRUM>


CH2
CH 1
CH 3
F.E
CH4

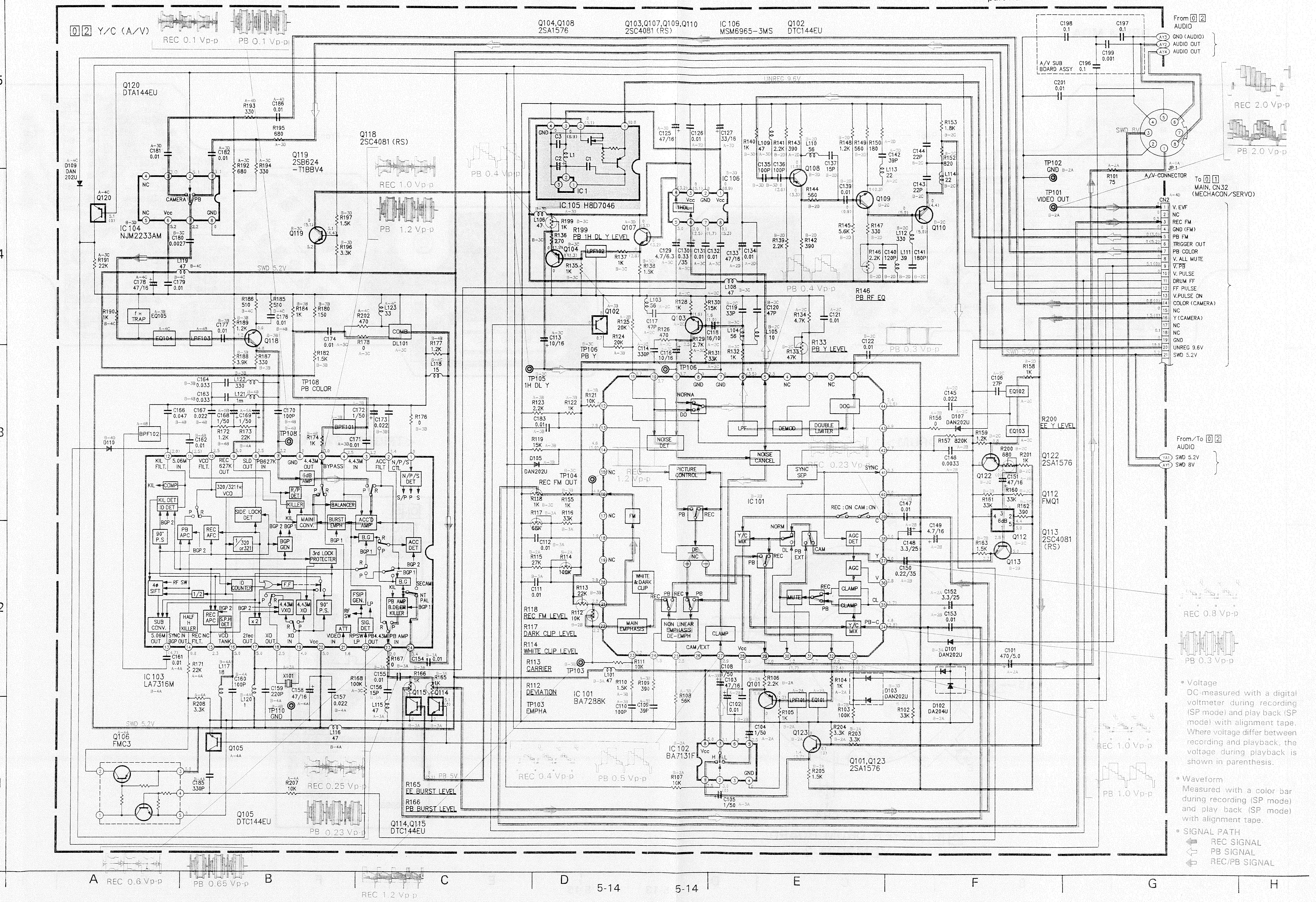
30 UPPER DRUM BOARD
YDM3021-2

<TRIGGER SWITCH>


05
TRIGGER SW
BOARD ASSY
YB20095A
BUZZER
SW2
OFF
ON
TRIGGER
SW 1
CN2
1
4
CN 1
3
YB20095

5.13 Y/C SCHEMATIC DIAGRAM

•Shaded (▨) parts are critical for safety. Replace only with specified part numbers.



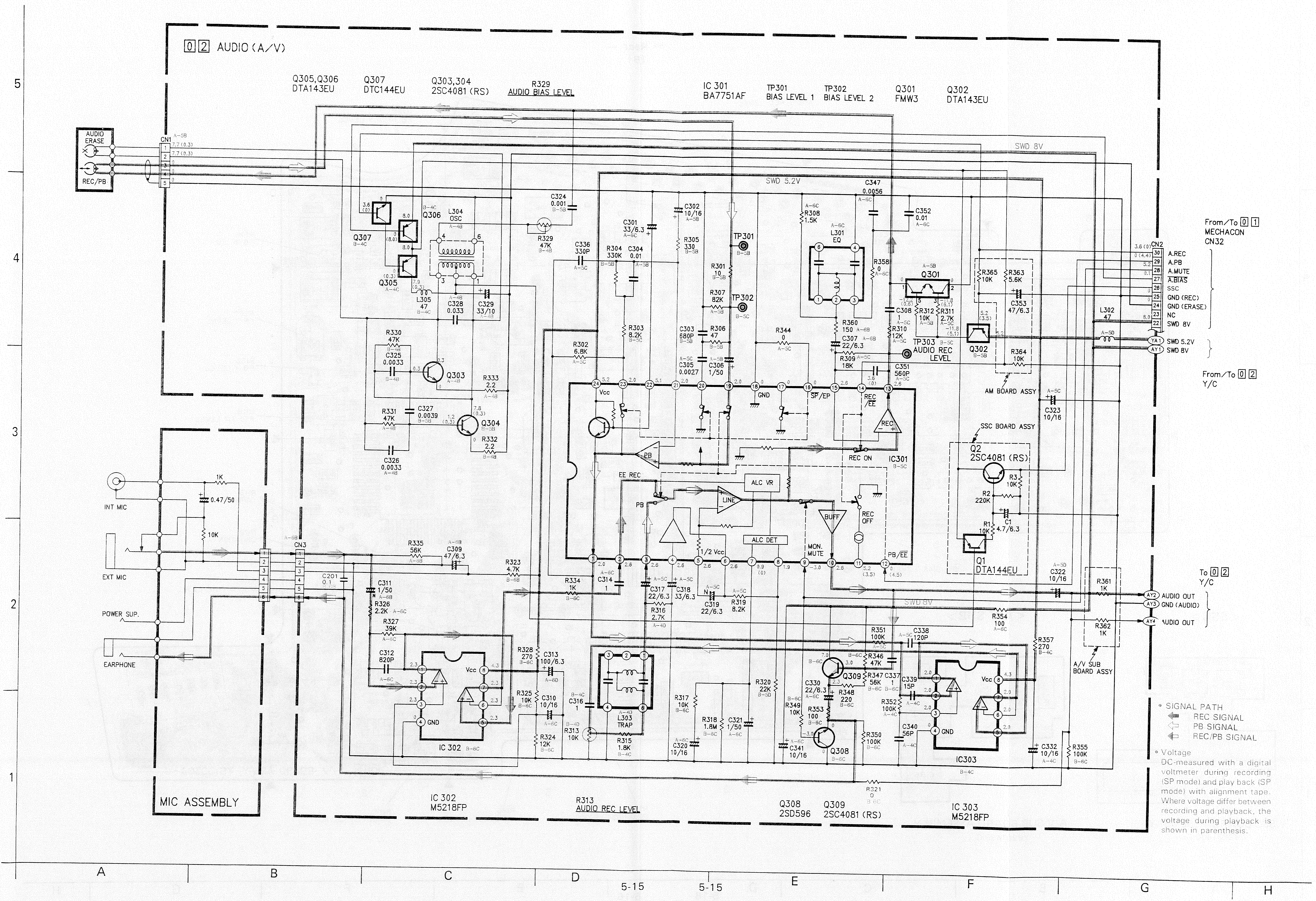
01 02 Y/C (A/V)
REC 0.1 Vp-p
PB 0.1 Vp-p
Q104,Q108 2SA1576
Q103,Q107,Q109,Q110 2SC4081 (RS)
IC106 MSM6965-3MS
Q102 DTC144EU
Q120 DTA144EU
Q118 2SC4081 (RS)
Q119 2SB624 -T1BBV4
IC104 NJM2233AM
IC105 H8D7046
IC101 BA7288K
IC102 BA7131F
IC103 LA7316M
Q106 FMC3
Q105 DTC144EU
Q114,Q115 DTC144EU
Q101,Q123 2SA1576
Q122 2SA1576
Q112 FMQ1
Q113 2SC4081 (RS)
R199 PB 1H DL Y LEVEL
R146 PB RF EQ
R133 PB Y LEVEL
R200 EE Y LEVEL
R118 REC FM LEVEL
R117 DARK CLIP LEVEL
R114 WHITE CLIP LEVEL
R113 CARRIER
R112 DEVIATION
R165 EE BURST LEVEL
R166 PB BURST LEVEL
TP101 VIDEO OUT
TP102 GND
TP103 EMPHA
TP104 REC FM OUT
TP105 1H DL Y
TP106 PB Y
TP108 PB COLOR
TP110 GND
UNREG 9.6V
SWD 5.2V
SWD 8V
A/V SUB BOARD ASSY
From 01 02 AUDIO
GND (AUDIO)
AUDIO OUT
AUDIO OUT
A/V CONNECTOR
To 01 MAIN, CN32 (MECHACON/SERVO)
CN2
1 V. EVF
2 NC
3 REC FM
4 GND (FM)
5 PB FM
6 TRIGGER OUT
7 PB COLOR
8 V. ALL MUTE
9 V. PB
10 V. PULSE
11 DRUM FF
12 FF PULSE
13 V.PULSE ON
14 COLOR (CAMERA)
15 NC
16 Y (CAMERA)
17 NC
18 NC
19 GND
20 UNREG 9.6V
21 SWD 5.2V
From/To 02 AUDIO
SWD 5.2V
SWD 8V
REC 2.0 Vp-p
PB 2.0 Vp-p
REC 1.0 Vp-p
PB 1.2 Vp-p
PB 0.4 Vp-p
PB 0.3 Vp-p
REC 1.2 Vp-p
REC 0.23 Vp-p
REC 0.8 Vp-p
REC 0.4 Vp-p
PB 0.5 Vp-p
PB 1.0 Vp-p
REC 0.25 Vp-p
PB 0.23 Vp-p
REC 0.6 Vp-p
PB 0.65 Vp-p
A B C D E F G H
1 2 3 4 5

• Voltage
DC-measured with a digital voltmeter during recording (SP mode) and play back (SP mode) with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

• Waveform
Measured with a color bar during recording (SP mode) and play back (SP mode) with alignment tape.

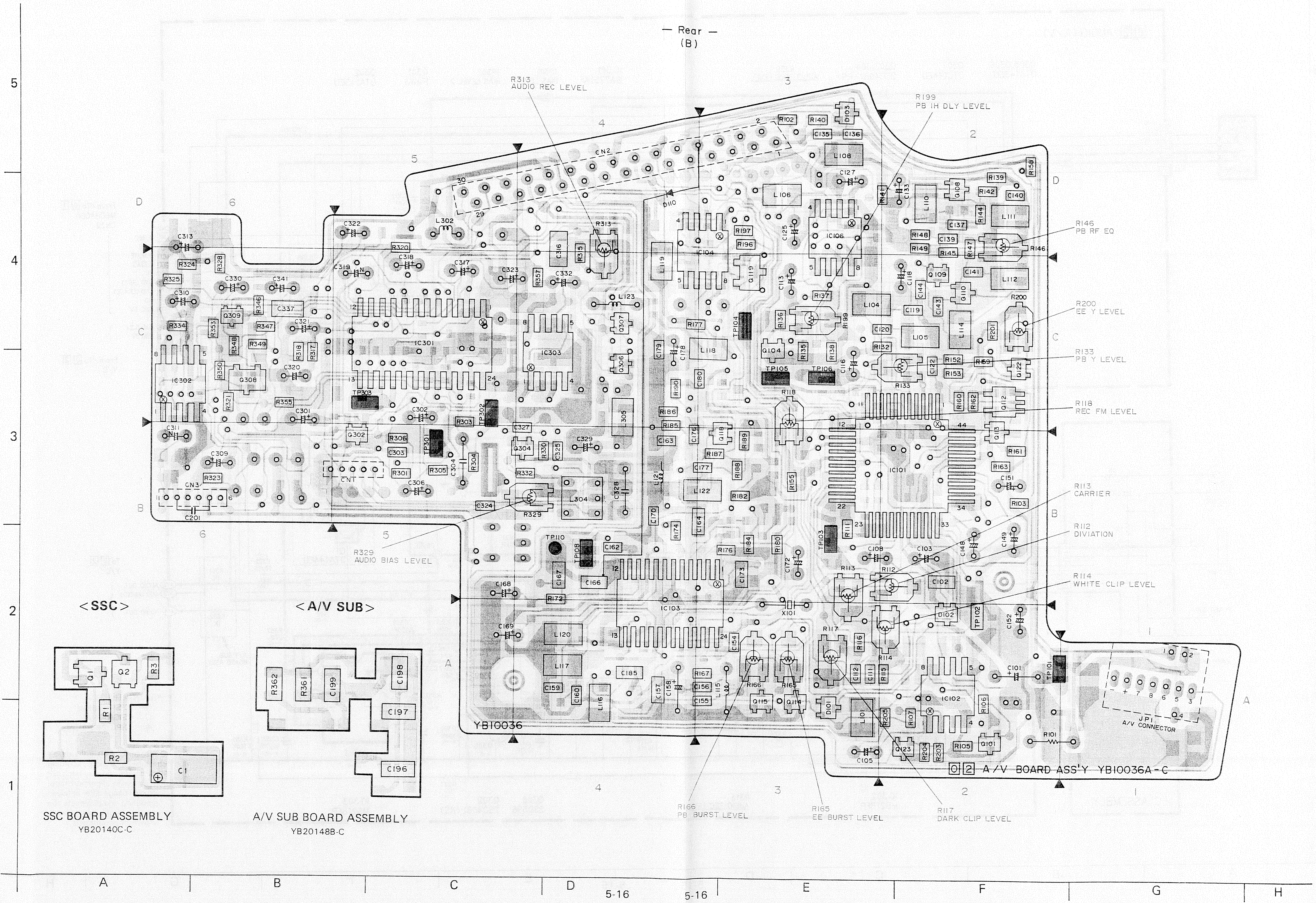
• SIGNAL PATH
⇦ REC SIGNAL
⇦ PB SIGNAL
⇦ REC/PB SIGNAL

5.14 AUDIO SCHEMATIC DIAGRAM


02 AUDIO (A/V)
Q305,Q306 DTA143EU
Q307 DTC144EU
Q303,304 2SC4081 (RS)
R329 AUDIO BIAS LEVEL
IC 301 BA7751AF
TP301 BIAS LEVEL 1
TP302 BIAS LEVEL 2
Q301 FMW3
Q302 DTA143EU
AUDIO ERASE
REC/PB
CN1
L304 OSC
SWD 8V
SWD 5.2V
TP301
TP302
TP303 AUDIO REC LEVEL
L301 EQ
Q301
Q302
AM BOARD ASSY
SSC BOARD ASSY
Q2 2SC4081 (RS)
Q1 DTA144EU
IC301
Vcc
GND
SP/EP
REC/EE
REC
PB
REC ON
EE REC
ALC VR
LINE
BUFF
REC OFF
ALC DET
1/2 Vcc
MON. MUTE
PB/EE
From/To 01 MECHACON CN32
CN2
A.REC
A.PB
A.MUTE
A.BIAS
SSC
GND (REC)
GND (ERASE)
NC
SWD 8V
SWD 5.2V
SWD 8V
From/To 02 Y/C
To 02 Y/C
AUDIO OUT
GND (AUDIO)
AUDIO OUT
A/V SUB BOARD ASSY
INT MIC
EXT MIC
POWER SUP.
EARPHONE
MIC ASSEMBLY
CN3
IC 302
L303 TRAP
Q309
Q308
IC303
IC 302 M5218FP
R313 AUDIO REC LEVEL
Q308 2SD596
Q309 2SC4081 (RS)
IC 303 M5218FP
A
B
C
D
E
F
G
H
1
2
3
4
5

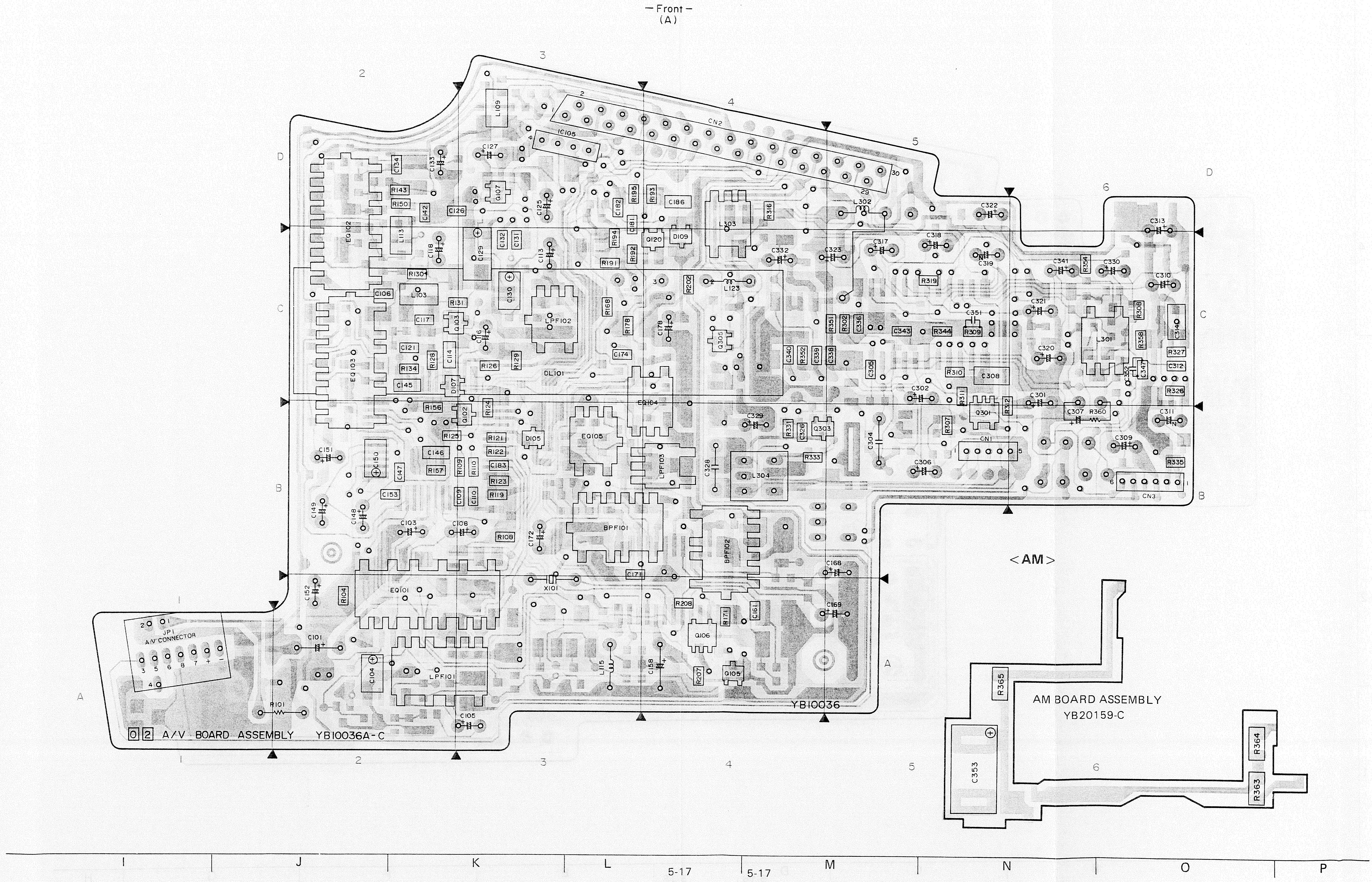
- SIGNAL PATH
  - REC SIGNAL
  - PB SIGNAL
  - REC/PB SIGNAL
- Voltage
  DC-measured with a digital voltmeter during recording (SP mode) and play back (SP mode) with alignment tape. Where voltage differ between recording and playback, the voltage during playback is shown in parenthesis.

5.15 A/V CIRCUIT BOARD

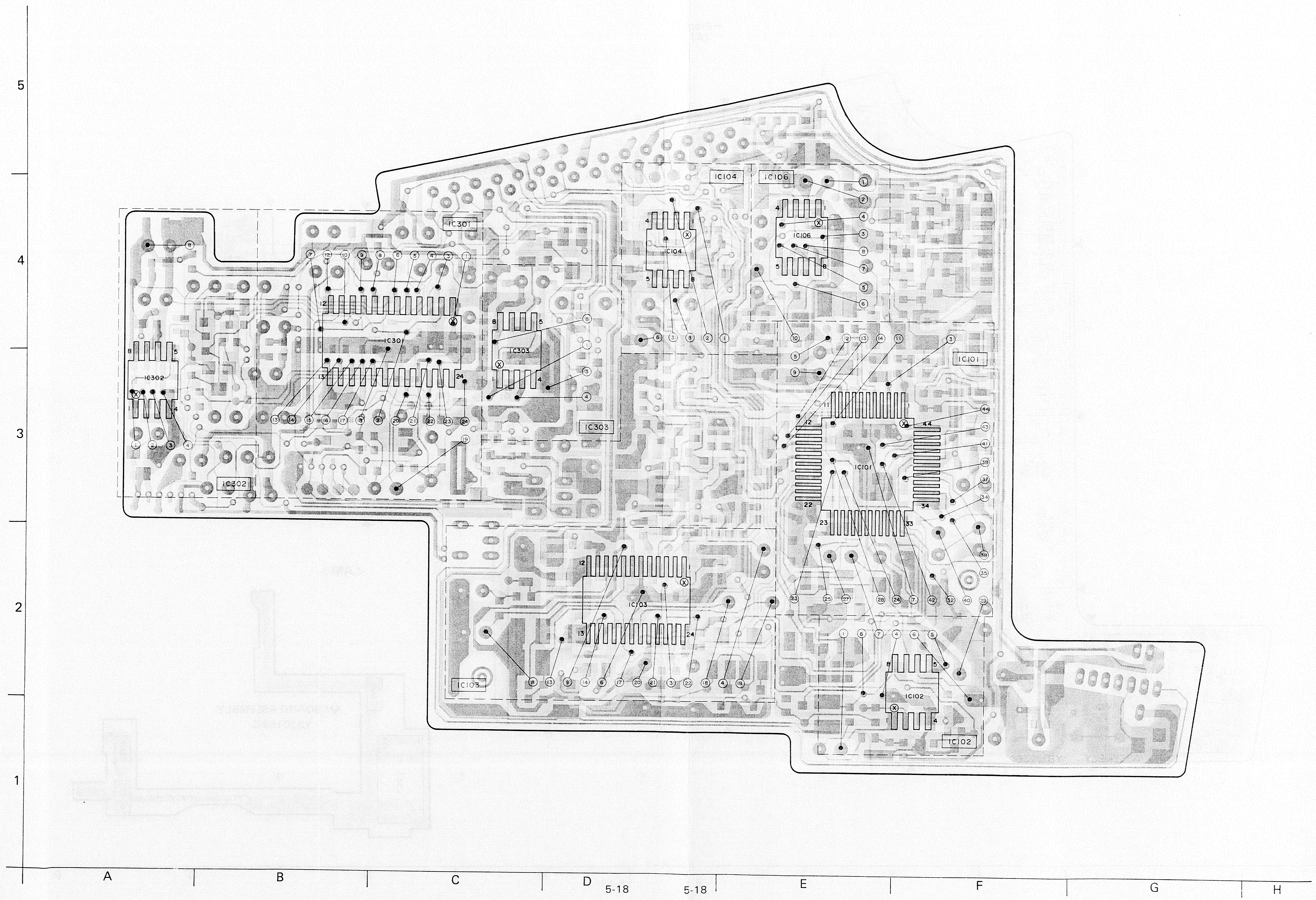

— Rear —
(B)
R313
AUDIO REC LEVEL
R199
PB 1H DLY LEVEL
R146
PB RF EQ
R200
EE Y LEVEL
R133
PB Y LEVEL
R118
REC FM LEVEL
R113
CARRIER
R112
DIVIATION
R114
WHITE CLIP LEVEL
R329
AUDIO BIAS LEVEL
R166
PB BURST LEVEL
R165
EE BURST LEVEL
R117
DARK CLIP LEVEL
CN2
CN3
CN1
JP1
A/V CONNECTOR
IC101
IC102
IC103
IC104
IC106
IC301
IC302
IC303
TP101
TP102
TP103
TP104
TP105
TP106
TP108
TP110
TP301
TP302
TP303
X101
YB10036
02 A/V BOARD ASS'Y YB10036A-C
<SSC>
<A/V SUB>
Q1
Q2
R3
R1
R2
C1
R362
R361
C199
C198
C197
C196
A
B
C
D
E
F
G
H
1
2
3
4
5
6

SSC BOARD ASSEMBLY
YB20140C-C

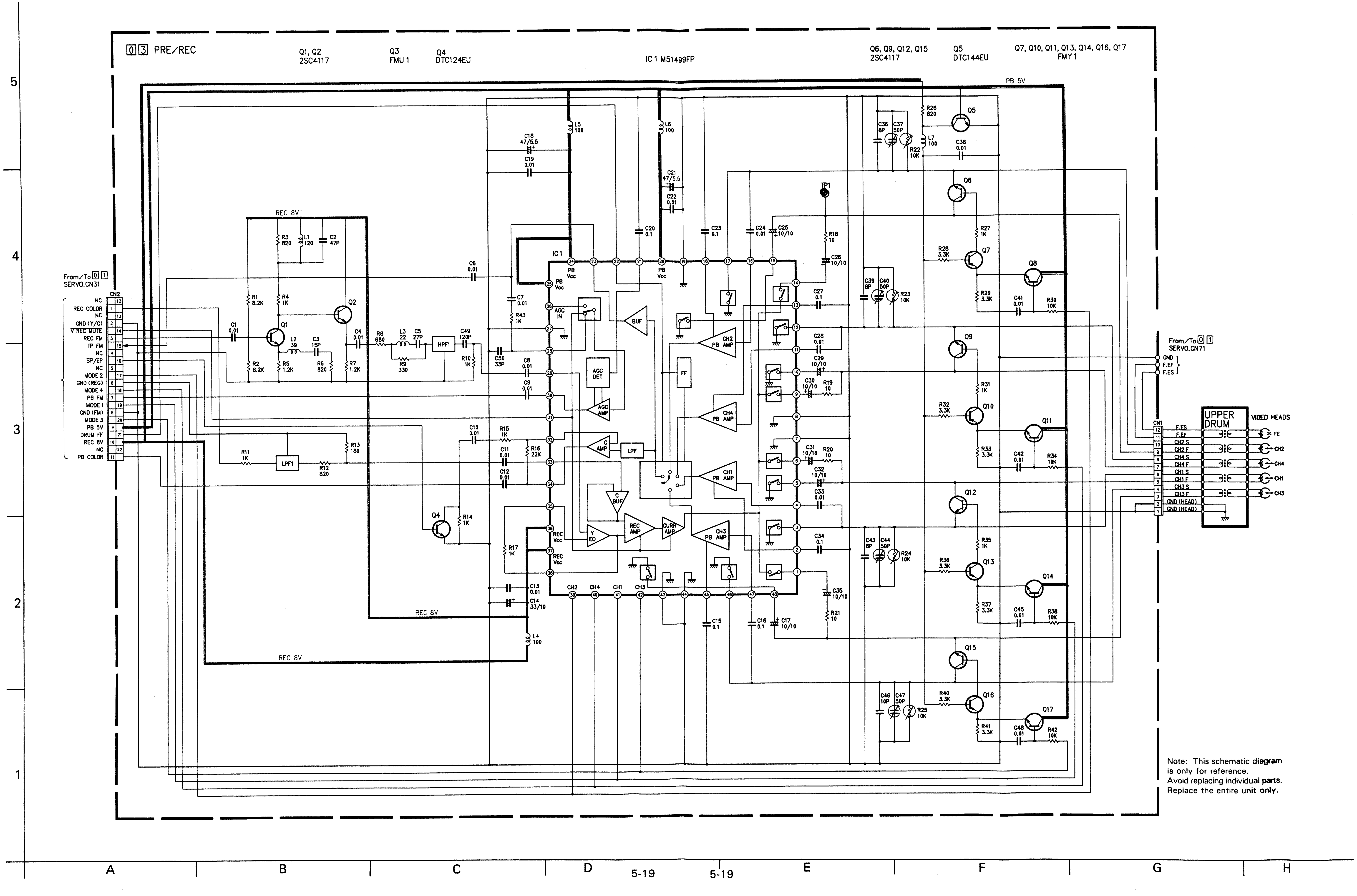
A/V SUB BOARD ASSEMBLY
YB20148B-C


– Front –
(A)
CN2
IC105
EQ102
EQ103
EQ101
EQ104
EQ105
LPF101
LPF102
LPF103
BPF101
BPF102
DL101
L301
L303
L304
L123
X101
CN1
CN3
JP1
A/V CONNECTOR
YB10036
02 A/V BOARD ASSEMBLY YB10036A-C
<AM>
AM BOARD ASSEMBLY
YB20159-C
C353
R363
R364
R365
I
J
K
L
M
N
O
P

5.16 A/V BOARD THROUGH HOLE LOCATION

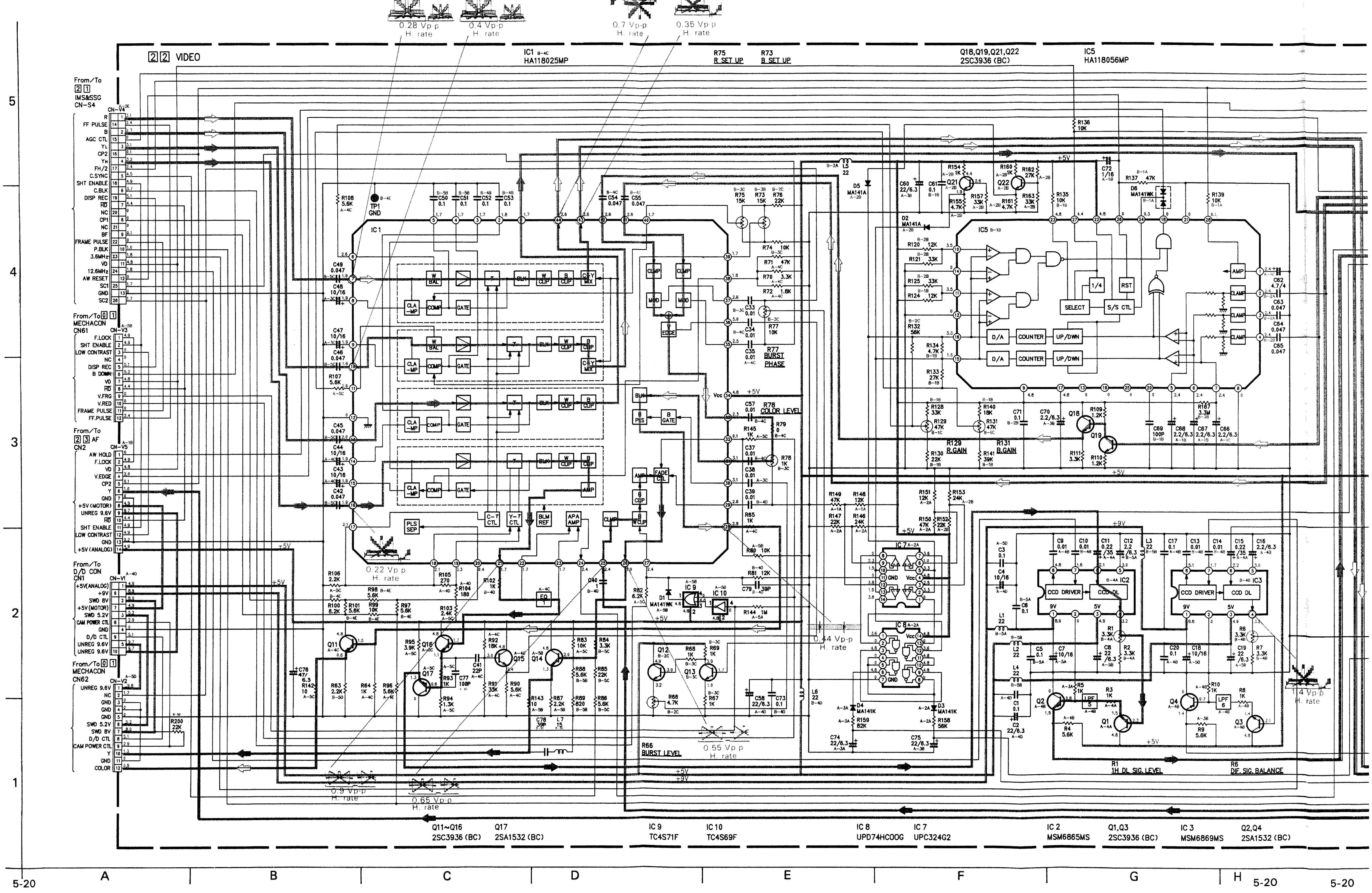

IC301
IC302
IC303
IC104
IC106
IC101
IC103
IC102
5
4
3
2
1
A
B
C
D
E
F
G
H

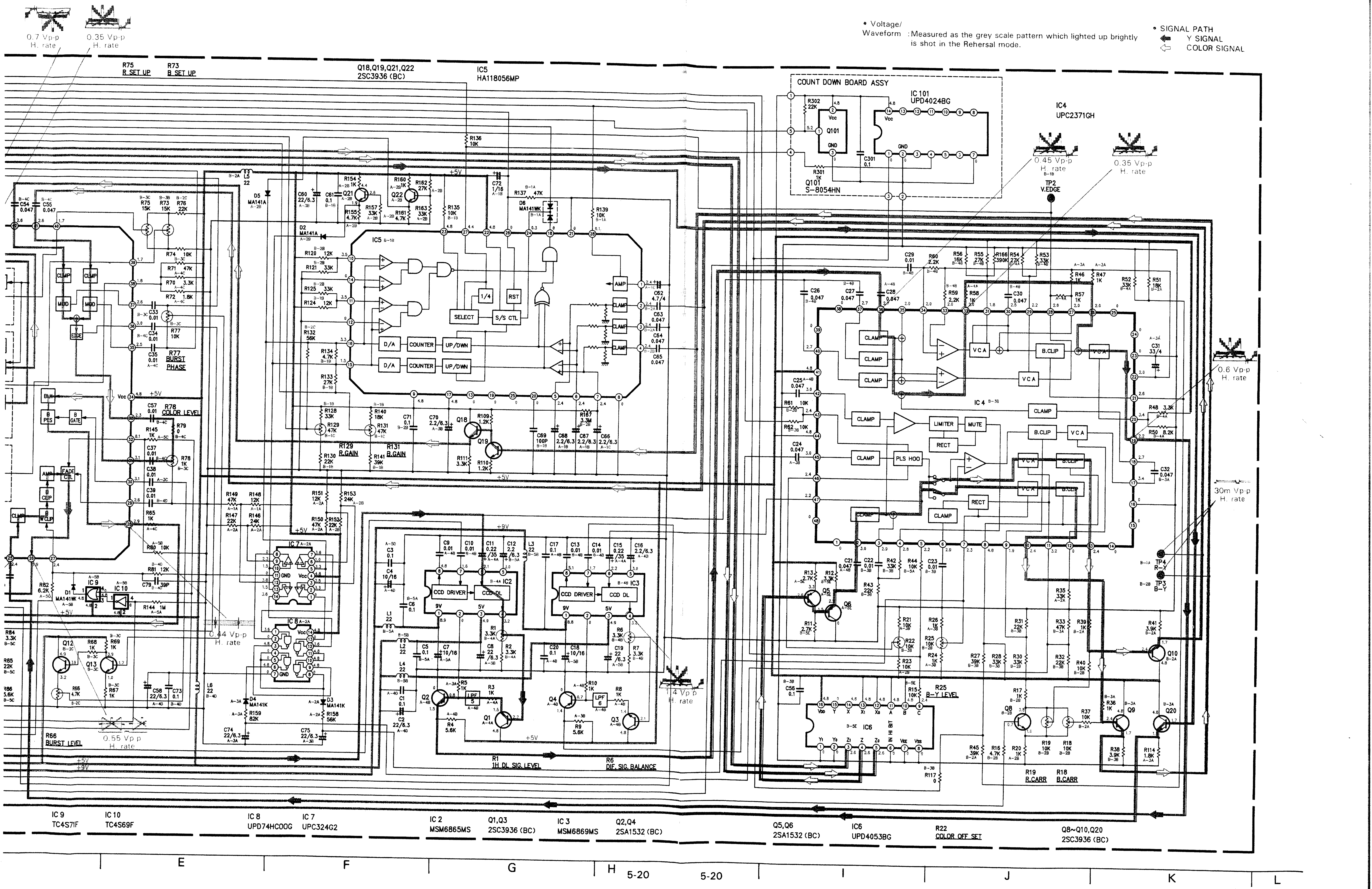
5.17 PRE/REC SCHEMATIC DIAGRAM


03 PRE/REC
Q1, Q2 2SC4117
Q3 FMU 1
Q4 DTC124EU
IC 1 M51499FP
Q6, Q9, Q12, Q15 2SC4117
Q5 DTC144EU
Q7, Q10, Q11, Q13, Q14, Q16, Q17 FMY 1
PB 5V
REC 8V
From/To 01 SERVO,CN31
CN2
NC
REC COLOR
NC
GND (Y/C)
V REC MUTE
REC FM
TP FM
NC
SP/EP
NC
MODE 2
GND (REG)
MODE 4
PB FM
MODE 1
GND (FM)
MODE 3
PB 5V
DRUM FF
REC 8V
NC
PB COLOR
From/To 01 SERVO,CN71
GND
F.EF
F.ES
CN1
F.ES
F.EF
CH2 S
CH2 F
CH4 S
CH4 F
CH1 S
CH1 F
CH3 S
CH3 F
GND (HEAD)
GND (HEAD)
UPPER DRUM
VIDEO HEADS
FE
CH2
CH4
CH1
CH3
IC1
PB Vcc
AGC IN
AGC DET
AGC AMP
C AMP
LPF
C BUF
Y EQ
REC AMP
CURR AMP
BUF
FF
CH1 PB AMP
CH2 PB AMP
CH3 PB AMP
CH4 PB AMP
REC Vcc
HPF1
LPF1
TP1
R1 8.2K
R2 8.2K
R3 820
R4 1K
R5 1.2K
R6 820
R7 1.2K
R8 680
R9 330
R10 1K
R11 1K
R12 820
R13 180
R14 1K
R15 1K
R16 22K
R17 1K
R18 10
R19 10
R20 10
R21 10
R22 10K
R23 10K
R24 10K
R25 10K
R26 820
R27 1K
R28 3.3K
R29 3.3K
R30 10K
R31 1K
R32 3.3K
R33 3.3K
R34 10K
R35 1K
R36 3.3K
R37 3.3K
R38 10K
R40 3.3K
R41 3.3K
R42 10K
R43 1K
C1 0.01
C2 47P
C3 15P
C4 0.01
C5 27P
C6 0.01
C7 0.01
C8 0.01
C9 0.01
C10 0.01
C11 0.01
C12 0.01
C13 0.01
C14 33/10
C15 0.1
C16 0.1
C17 10/10
C18 47/5.5
C19 0.01
C20 0.1
C21 47/5.5
C22 0.01
C23 0.1
C24 0.01
C25 10/10
C26 10/10
C27 0.1
C28 0.01
C29 10/10
C30 10/10
C31 10/10
C32 10/10
C33 0.01
C34 0.1
C35 10/10
C36 8P
C37 50P
C38 0.01
C39 8P
C40 50P
C41 0.01
C42 0.01
C43 8P
C44 50P
C45 0.01
C46 10P
C47 50P
C48 0.01
C49 120P
C50 33P
L1 120
L2 39
L3 22
L4 100
L5 100
L6 100
L7 100
1
2
3
4
5
A
B
C
D
E
F
G
H

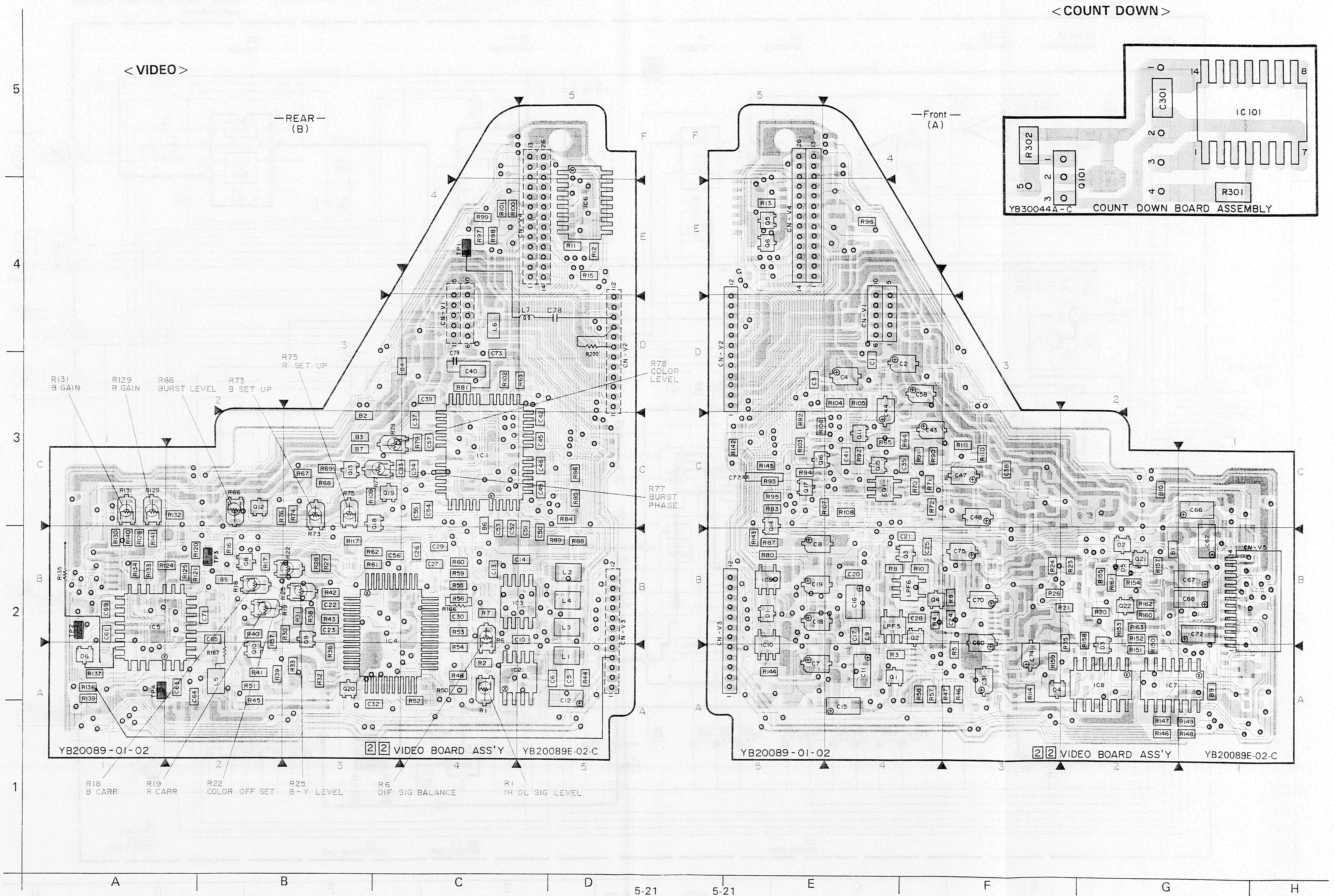
Note: This schematic diagram is only for reference. Avoid replacing individual parts. Replace the entire unit only.

5.18 VIDEO SCHEMATIC DIAGRAM


2 2 VIDEO
0.28 Vp-p H. rate
0.4 Vp-p H. rate
0.7 Vp-p H. rate
0.35 Vp-p H. rate
IC1 HA118025MP
R75 R SET UP
R73 B SET UP
Q18,Q19,Q21,Q22 2SC3936 (BC)
IC5 HA118056MP
From/To 2 1 IMS&SSG CN-S4
CN-V4
R
FF PULSE
B
AGC CTL
YL
CP2
YH
FH/2
C.SYNC
SHT ENABLE
C.BLK
DISP REC
HD
NC
CP1
NC
BF
FRAME PULSE
P.BLK
3.6MHz
VD
12.6MHz
AW RESET
SC1
GND
SC2
From/To 0 1 MECHACON CN61
CN-V3
F.LOCK
SHT ENABLE
LOW CONTRAST
NC
DISP REC
B DOWN
VD
HD
V.FRG
V.RED
FRAME PULSE
FF.PULSE
From/To 2 3 AF CN2
CN-V5
AW HOLD
F.LOCK
VD
V.EDGE
CP2
Y
GND
+5V (MOTOR)
UNREG 9.6V
HD
SHT ENABLE
LOW CONTRAST
GND
+5V (ANALOG)
From/To D/D CON CN1
CN-V1
+5V(ANALOG)
+9V
SWD 8V
+5V (MOTOR)
SWD 5.2V
CAM POWER CTL
GND
D/D CTL
UNREG 9.6V
UNREG 9.6V
From/To 0 1 MECHACON CN62
CN-V2
UNREG 9.6V
NC
GND
GND
GND
SWD 5.2V
SWD 8V
D/D CTL
CAM POWER CTL
Y
GND
COLOR
R200 22K
TP1 GND
W BAL
BLK
W CLIP
B CLIP
C+Y MIX
CLA -MP
COMP
GATE
CLMP
MOD
EDGE
PLS SEP
C-T CTL
Y-T CTL
BLM REF
APA AMP
B WCLP
FADE CTL
B GATE
B PCS
EQ
R77 BURST PHASE
R78 COLOR LEVEL
R66 BURST LEVEL
R129 R.GAIN
R131 B.GAIN
SELECT
S/S CTL
1/4
RST
D/A
COUNTER
UP/DWN
AMP
CLAMP
IC9
IC10
IC7
IC8
CCD DRIVER
CCD DL
IC2
IC3
LPF
R1 1H DL SIG. LEVEL
R6 DIF. SIG. BALANCE
0.22 Vp-p H. rate
0.9 Vp-p H. rate
0.65 Vp-p H. rate
0.44 Vp-p H. rate
0.55 Vp-p H. rate
1.4 Vp-p H. rate
+5V
+9V
Q11~Q16 2SC3936 (BC)
Q17 2SA1532 (BC)
IC9 TC4S71F
IC10 TC4S69F
IC8 UPD74HC00G
IC7 UPC324G2
IC2 MSM6865MS
Q1,Q3 2SC3936 (BC)
IC3 MSM6869MS
Q2,Q4 2SA1532 (BC)
1
2
3
4
5
A
B
C
D
E
F
G
H

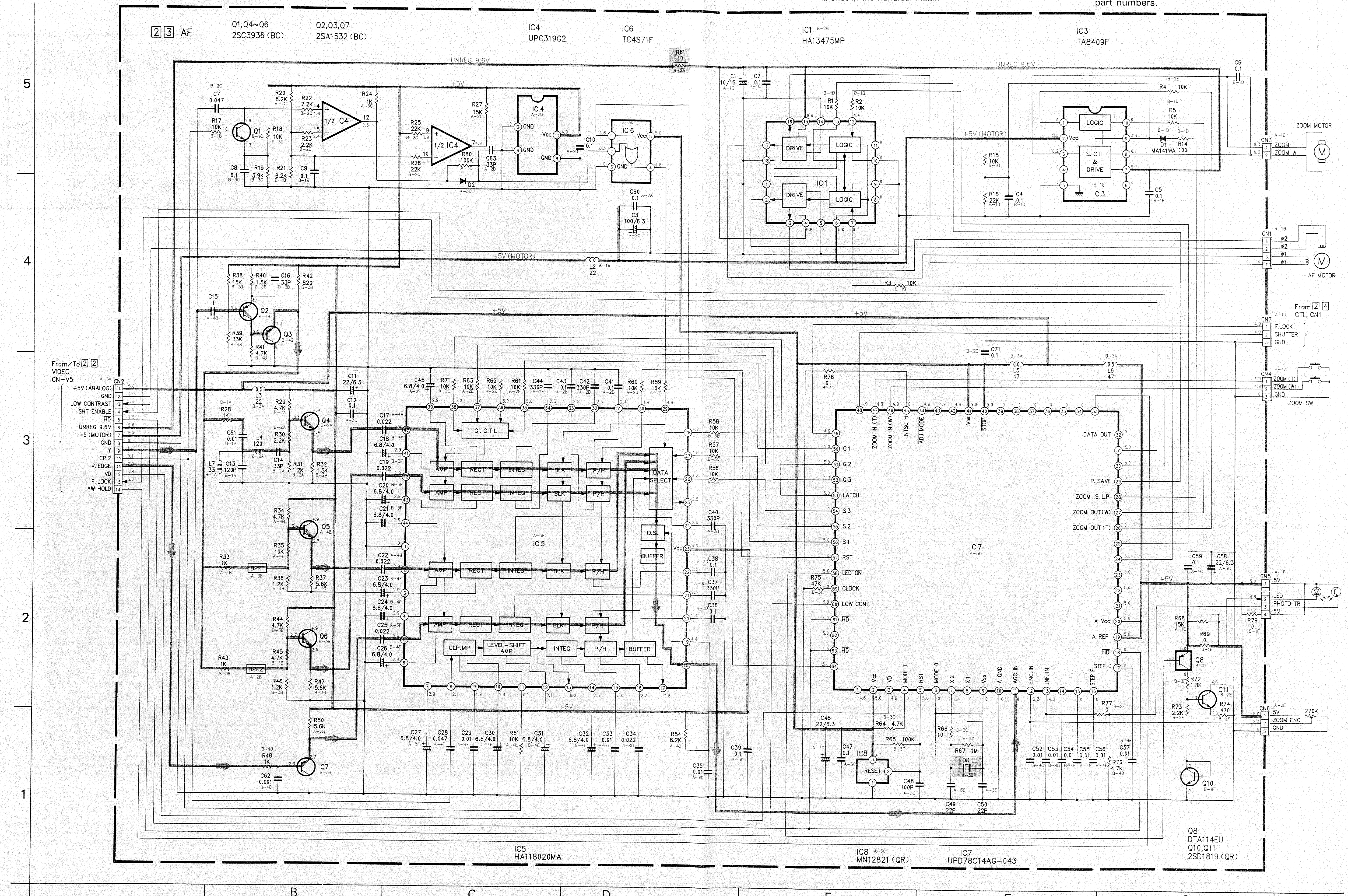
 • Voltage/ Waveform :Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.
• SIGNAL PATH
Y SIGNAL
COLOR SIGNAL
0.7 Vp-p H. rate
0.35 Vp-p H. rate
R75 R SET UP
R73 B SET UP
Q18,Q19,Q21,Q22 2SC3936 (BC)
IC5 HA118056MP
COUNT DOWN BOARD ASSY
IC 101 UPD4024BG
Q101 S-8054HN
R302 22K
R301 1K
C301 0.1
IC4 UPC2371GH
0.45 Vp-p H. rate
0.35 Vp-p H. rate
TP2 V.EDGE
0.6 Vp-p H. rate
30m Vp-p H. rate
TP4 R-Y
TP3 B-Y
R77 BURST PHASE
R78 COLOR LEVEL
R129 R.GAIN
R131 B.GAIN
R66 BURST LEVEL
0.55 Vp-p H. rate
0.44 Vp-p H. rate
1.4 Vp-p H. rate
CLMP
MOD
Y EDGE
BLK
B PES
B GATE
AMP
FADE CTL
B CLIP
W CLIP
SELECT
S/S CTL
1/4
RST
D/A
COUNTER
UP/DWN
AMP
CLAMP
CCD DRIVER
CCD DL
LPF
VCA
B.CLIP
LIMITER
MUTE
RECT
PLS HOO
R1 1H DL SIG. LEVEL
R6 DIF. SIG. BALANCE
R25 B-Y LEVEL
R19 R.CARR
R18 B.CARR
R22 COLOR OFF SET
IC 9 TC4S71F
IC 10 TC4S69F
IC 8 UPD74HC00G
IC 7 UPC324G2
IC 2 MSM6865MS
Q1,Q3 2SC3936 (BC)
IC 3 MSM6869MS
Q2,Q4 2SA1532 (BC)
Q5,Q6 2SA1532 (BC)
IC6 UPD4053BG
Q8~Q10,Q20 2SC3936 (BC)
+5V
+9V
E
F
G
H
I
J
K
L

5.19 VIDEO AND COUNT DOWN CIRCUIT BOARDS


<VIDEO>
—REAR— (B)
—Front— (A)
<COUNT DOWN>
R131 B GAIN
R129 R GAIN
R66 BURST LEVEL
R73 B SET UP
R75 R SET UP
R78 COLOR LEVEL
R77 BURST PHASE
R18 B CARR
R19 R CARR
R22 COLOR OFF SET
R25 B-Y LEVEL
R6 DIF SIG BALANCE
R1 1H DL SIG LEVEL
YB20089-01-02
2 2 VIDEO BOARD ASS'Y YB20089E-02-C
YB20089-01-02
2 2 VIDEO BOARD ASS'Y YB20089E-02-C
YB30044A-C COUNT DOWN BOARD ASSEMBLY
IC101
C301
Q101
R301
R302
IC1
IC4
IC5
IC6
IC7
IC8
CN-V1
CN-V2
CN-V3
CN-V4
CN-V5
TP1
TP2
TP3
TP4
A
B
C
D
E
F
G
H
1
2
3
4
5

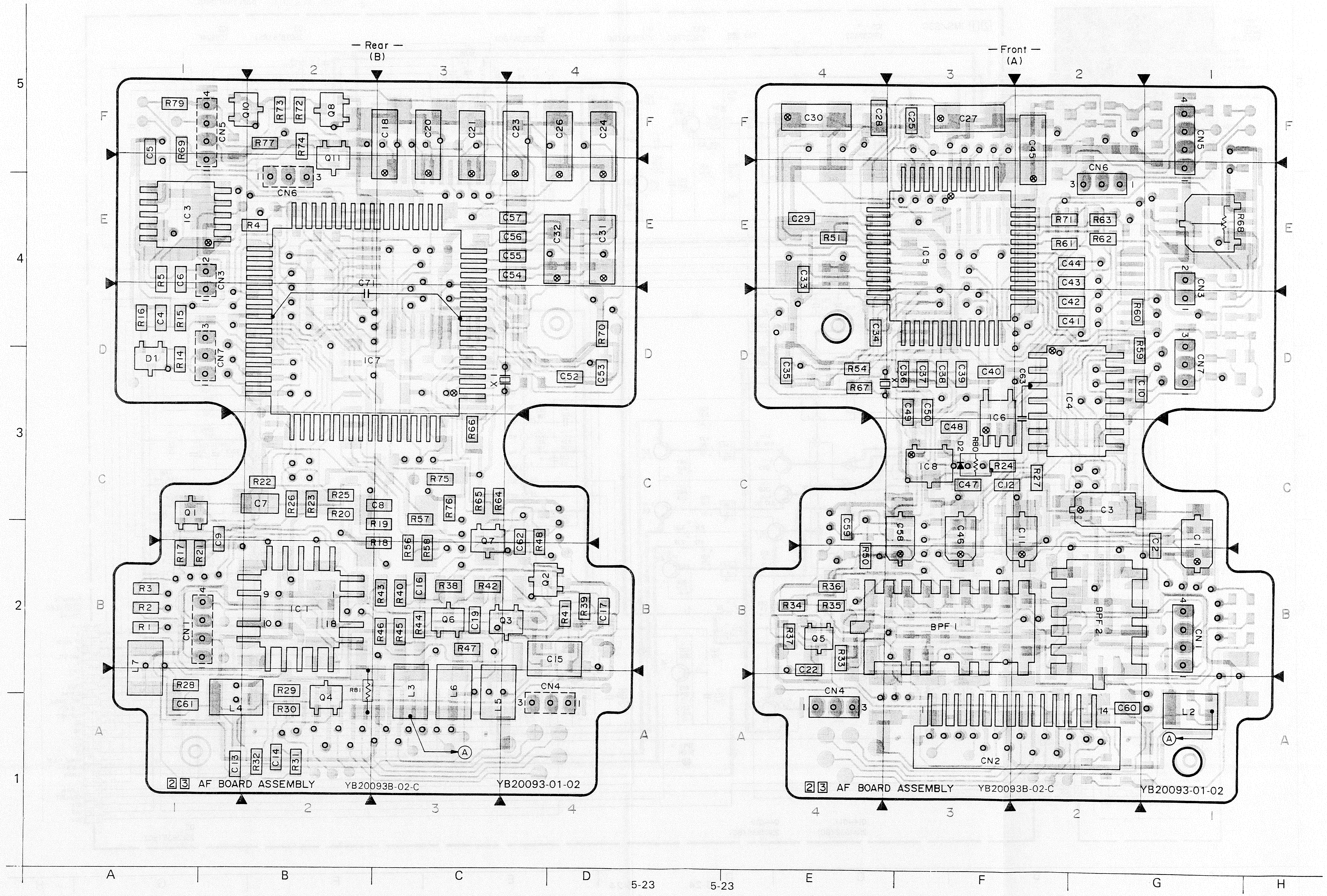
5.20 AF SCHEMATIC DIAGRAM

- Voltage/Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehearsal mode.
- Shaded (▨) parts are critical for safety. Replace only with specified part numbers.



2 3 AF
Q1,Q4~Q6 2SC3936 (BC)
Q2,Q3,Q7 2SA1532 (BC)
IC4 UPC319G2
IC6 TC4S71F
IC1 HA13475MP
IC3 TA8409F
UNREG 9.6V
+5V
+5V (MOTOR)
R81 10
1/2 IC4
IC 4
IC 6
DRIVE
LOGIC
IC 1
S. CTL & DRIVE
IC 3
D1 MA141WA
D2
L2 22
ZOOM MOTOR
CN3 ZOOM T ZOOM W
CN1 φ2 φ2 φ1 φ1
AF MOTOR
From 2 4 CTL, CN1
CN7 F.LOCK SHUTTER GND
CN4 ZOOM (T) ZOOM (W) GND
ZOOM SW
From/To 2 2 VIDEO CN-V5
CN2
+5V (ANALOG)
GND
LOW CONTRAST
SHT ENABLE
HD
UNREG 9.6V
+5 (MOTOR)
GND
Y
CP 2
V. EDGE
VD
F. LOCK
AW HOLD
BPF1
BPF2
G. CTL
AMP
RECT
INTEG
BLK
P/H
DATA SELECT
O.S.
BUFFER
CLP.MP
LEVEL-SHIFT AMP
IC 5
IC 7
ZOOM IN (T)
ZOOM IN (W)
NTSC H
ADJ MODE
Vcc
STOP
DATA OUT
G1
G2
G3
LATCH
S3
S2
S1
RST
LED ON
CLOCK
LOW CONT.
HD
P. SAVE
ZOOM .S. LIP
ZOOM OUT (W)
ZOOM OUT (T)
A Vcc
A. REF
STEP C
STEP F
VD
MODE 1
MODE 0
X2
X1
Vss
A GND
AGC IN
ENC. IN
INF. IN
IC8
RESET
X1
L5 47
L6 47
CN5 5V LED PHOTO TR 5V
CN6 5V ZOOM ENC. GND
Q8
Q10
Q11
IC5 HA118020MA
IC8 MN12821 (QR)
IC7 UPD78C14AG-043
Q8 DTA114EU
Q10,Q11 2SD1819 (QR)
1
2
3
4
5
B
C
D
E
F
G
H

5.21 AF CIRCUIT BOARD



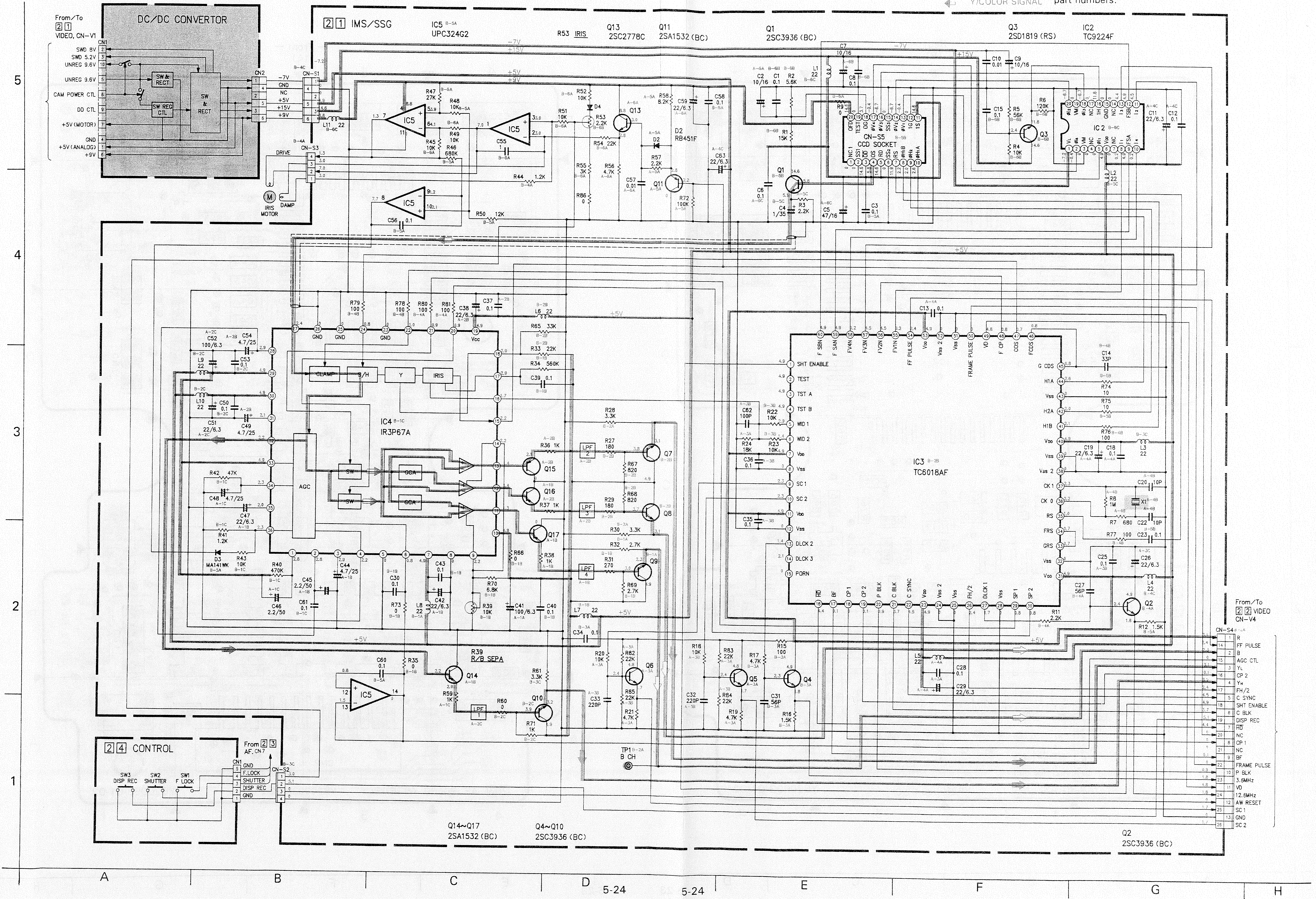
— Rear —
(B)
— Front —
(A)
2 3 AF BOARD ASSEMBLY
YB20093B-02-C
YB20093-01-02
IC1
IC3
IC4
IC5
IC6
IC7
IC8
BPF 1
BPF 2
CN1
CN2
CN3
CN4
CN5
CN6
CN7
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q10
Q11
D1
D2
X1
L2
L3
L4
L5
L6
L7
A
B
C
D
E
F
G
H

5.22 IMS/SSG AND CONTROL SCHEMATIC DIAGRAM

• Voltage/Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Rehersal mode.

• SIGNAL PATH
- Y SIGNAL
- COLOR SIGNAL
- Y/COLOR SIGNAL

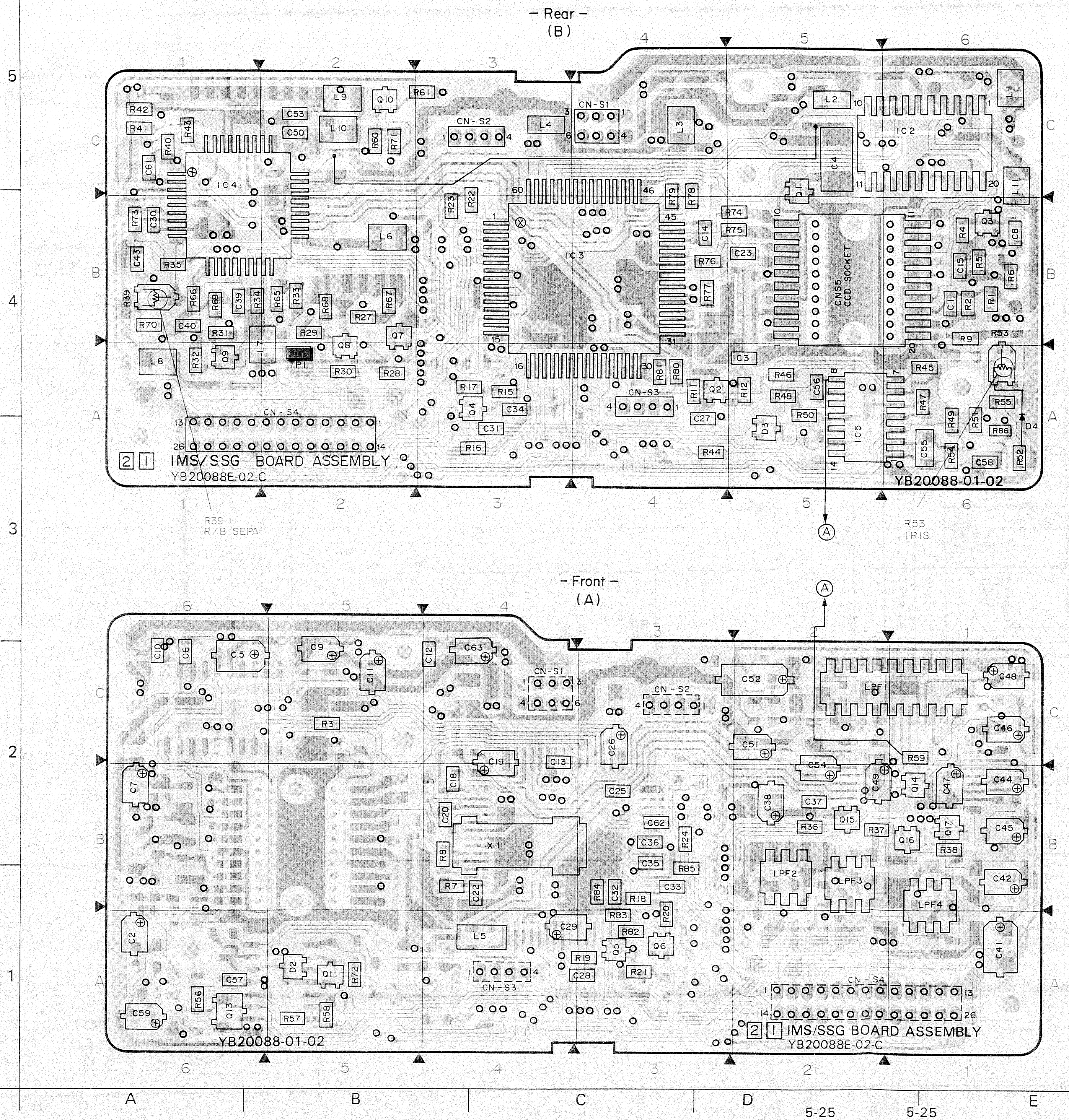
Shaded (▨) parts are critical for safety. Replace only with specified part numbers.


From/To
2 1
VIDEO, CN-V1
DC/DC CONVERTOR
SW & RECT
SW REG CTL
SW & RECT
SWD 8V
SWD 5.2V
UNREG 9.6V
UNREG 9.6V
CAM POWER CTL
DD CTL
+5V (MOTOR)
GND
+5V (ANALOG)
+9V
CN1
CN2
CN-S1
CN-S3
DRIVE
IRIS MOTOR
DAMP
2 1 IMS/SSG
IC5 UPC324G2
R53 IRIS
Q13 2SC2778C
Q11 2SA1532 (BC)
Q1 2SC3936 (BC)
Q3 2SD1819 (RS)
IC2 TC9224F
CN-S5 CCD SOCKET
IC4 IR3P67A
CLAMP
S/H
Y
IRIS
AGC
SW
GCA
LPF
IC3 TC6018AF
D3 MA141WK
D2 RB451F
R39 R/B SEPA
TP1 B CH
2 4 CONTROL
SW3 DISP REC
SW2 SHUTTER
SW1 F LOCK
From 2 3 AF, CN7
CN-S2
GND
F.LOCK
SHUTTER
DISP REC
Q14~Q17 2SA1532 (BC)
Q4~Q10 2SC3936 (BC)
Q2 2SC3936 (BC)
From/To 2 2 VIDEO CN-V4
CN-S4
R
FF PULSE
B
AGC CTL
YL
CP 2
Y+
FH/2
C SYNC
SHT ENABLE
C BLK
DISP REC
HD
NC
CP 1
NC
BF
FRAME PULSE
P BLK
3.6MHz
VD
12.6MHz
AW RESET
SC 1
GND
SC 2
A
B
C
D
E
F
G
H
1
2
3
4
5

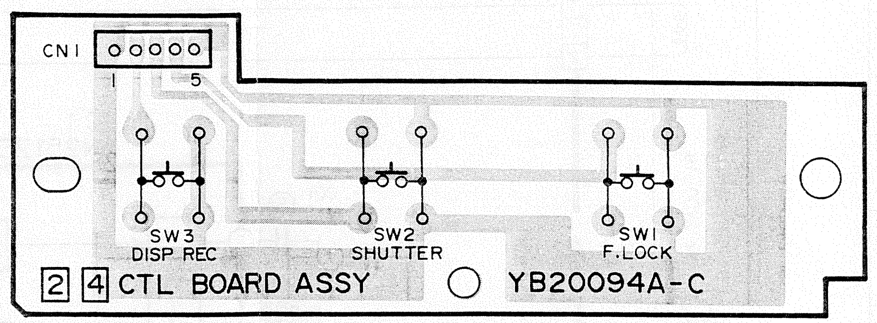
5-24

5.23 IMS/SSG AND CONTROL CIRCUIT BOARDS

<IMS/SSG>

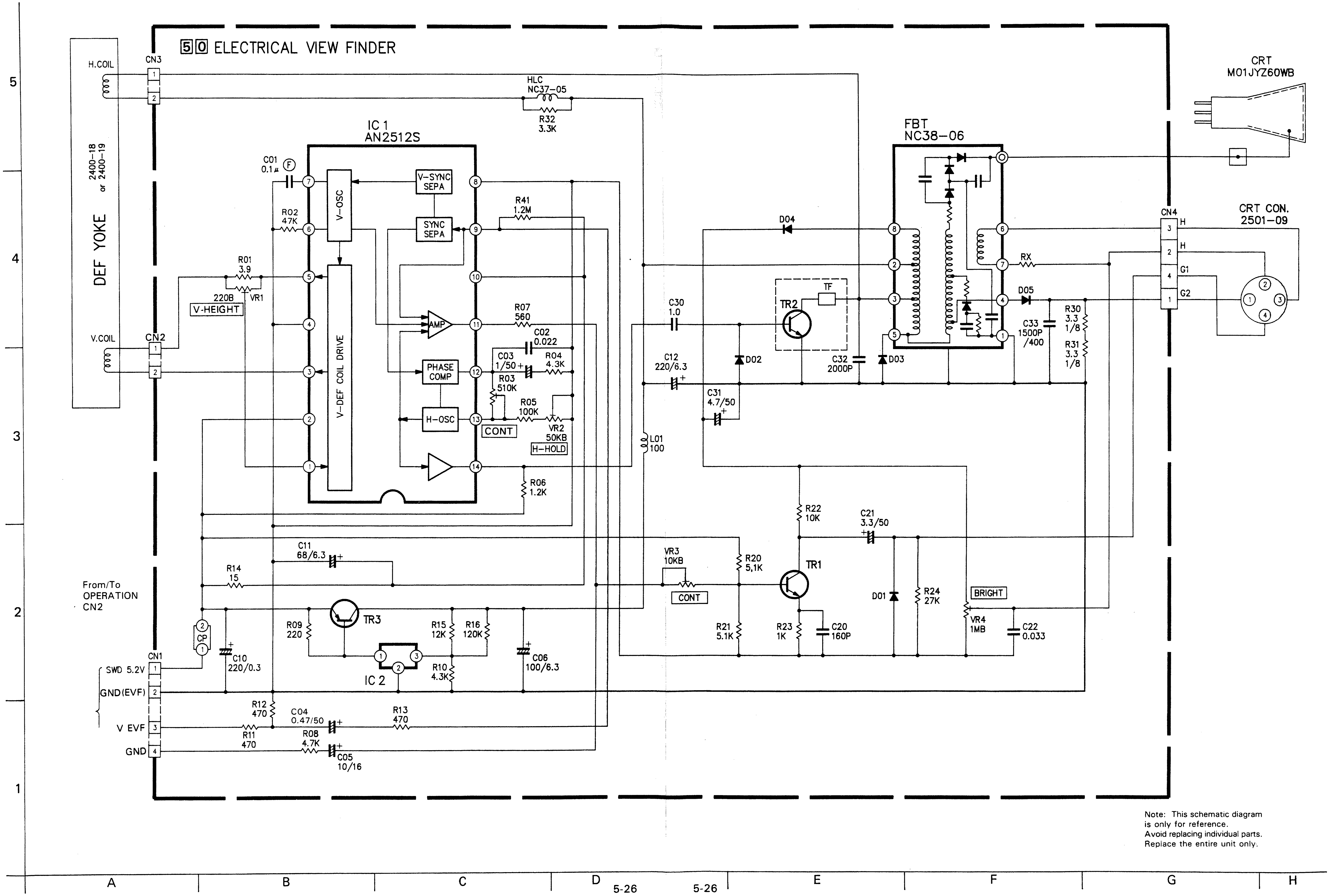

- Rear -
(B)
IC4
IC3
IC2
IC5
CN55 CCD SOCKET
CN-S1
CN-S2
CN-S3
CN-S4
TP1
2 1 IMS/SSG BOARD ASSEMBLY
YB20088E-02-C
YB20088-01-02
R39 R/B SEPA
R53 IRIS
A
- Front -
(A)
LPF1
LPF2
LPF3
LPF4
X1
2 1 IMS/SSG BOARD ASSEMBLY
YB20088E-02-C
YB20088-01-02
1
2
3
4
5
6
A
B
C
D
E

<CONTROL>


CN1
SW3 DISP REC
SW2 SHUTTER
SW1 F.LOCK
2 4 CTL BOARD ASSY
YB20094A-C

F
G
H

5.24 ELECTRICAL VIEW FINDER SCHEMATIC DIAGRAM


50 ELECTRICAL VIEW FINDER
DEF YOKE
2400-18 or 2400-19
H.COIL
V.COIL
CN3
CN2
CN1
CN4
HLC NC37-05
R32 3.3K
IC 1 AN2512S
V-OSC
V-SYNC SEPA
SYNC SEPA
AMP
PHASE COMP
H-OSC
V-DEF COIL DRIVE
C01 0.1μ
F
R02 47K
R01 3.9
220B
VR1
V-HEIGHT
R41 1.2M
R07 560
C02 0.022
C03 1/50
R04 4.3K
R03 510K
R05 100K
VR2 50KB
CONT
H-HOLD
R06 1.2K
FBT NC38-06
CRT M01JYZ60WB
CRT CON. 2501-09
H
G1
G2
D04
TF
TR2
C30 1.0
C12 220/6.3
D02
C31 4.7/50
C32 2000P
D03
L01 100
RX
D05
C33 1500P /400
R30 3.3 1/8
R31 3.3 1/8
R22 10K
C21 3.3/50
VR3 10KB
CONT
R20 5,1K
TR1
D01
R24 27K
BRIGHT
VR4 1MB
C22 0.033
R21 5.1K
R23 1K
C20 160P
C11 68/6.3
R14 15
From/To OPERATION CN2
CP
TR3
R09 220
R15 12K
R16 120K
IC 2
R10 4.3K
C10 220/0.3
C06 100/6.3
SWD 5.2V
GND(EVF)
V EVF
GND
R12 470
C04 0.47/50
R13 470
R11 470
R08 4.7K
C05 10/16
1
2
3
4
5
A
B
C
D
E
F
G
H

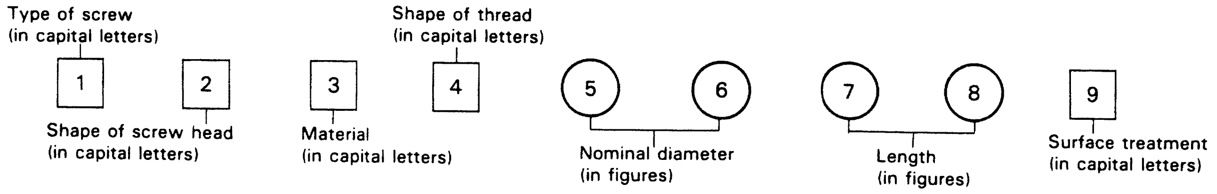
Note: This schematic diagram
is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

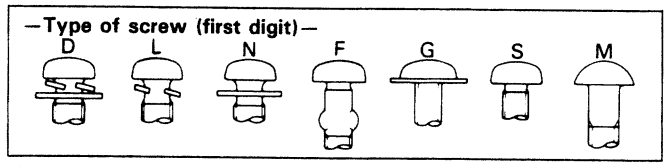
6.1.1 Screw coding

Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

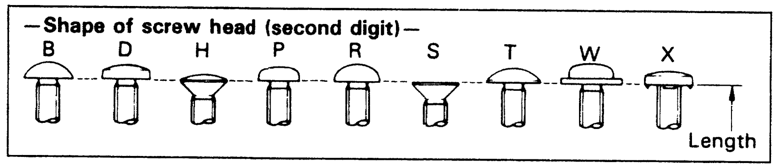
Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L 〃 (with spring washer)
- N 〃 (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws


–Type of screw (first digit)–
D
L
N
F
G
S
M

Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head

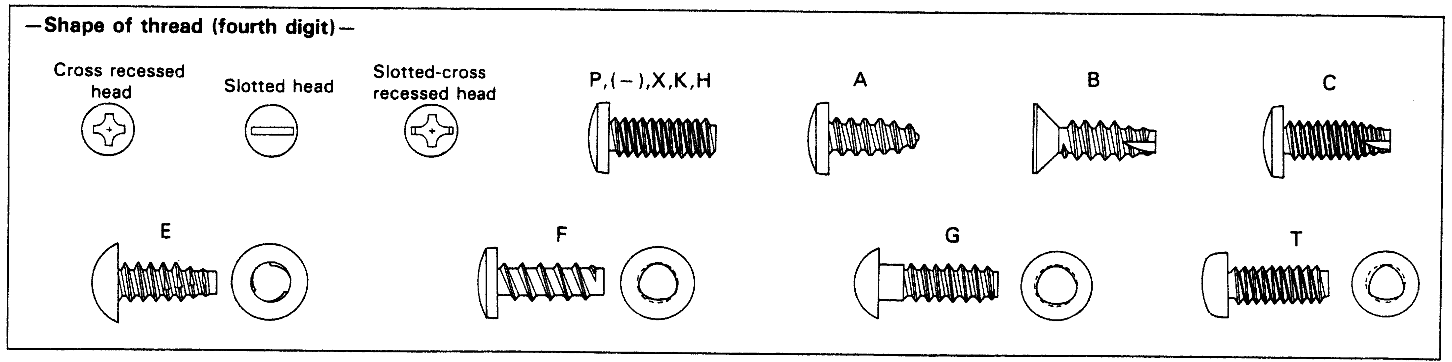

–Shape of screw head (second digit)–
B
D
H
P
R
S
T
W
X
Length

Material (third digit)

- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of thread (fourth digit)

- P Cross recessed head screws
- (–) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H 〃 (type 3)
- A Cross recessed head tapping screws (type 1)
- B 〃 (type 2)
- C 〃 (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F 〃 (brand : P-tight)
- T 〃 (brand : taptight)
- G 〃


–Shape of thread (fourth digit)–
Cross recessed head
Slotted head
Slotted-cross recessed head
P,(–),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

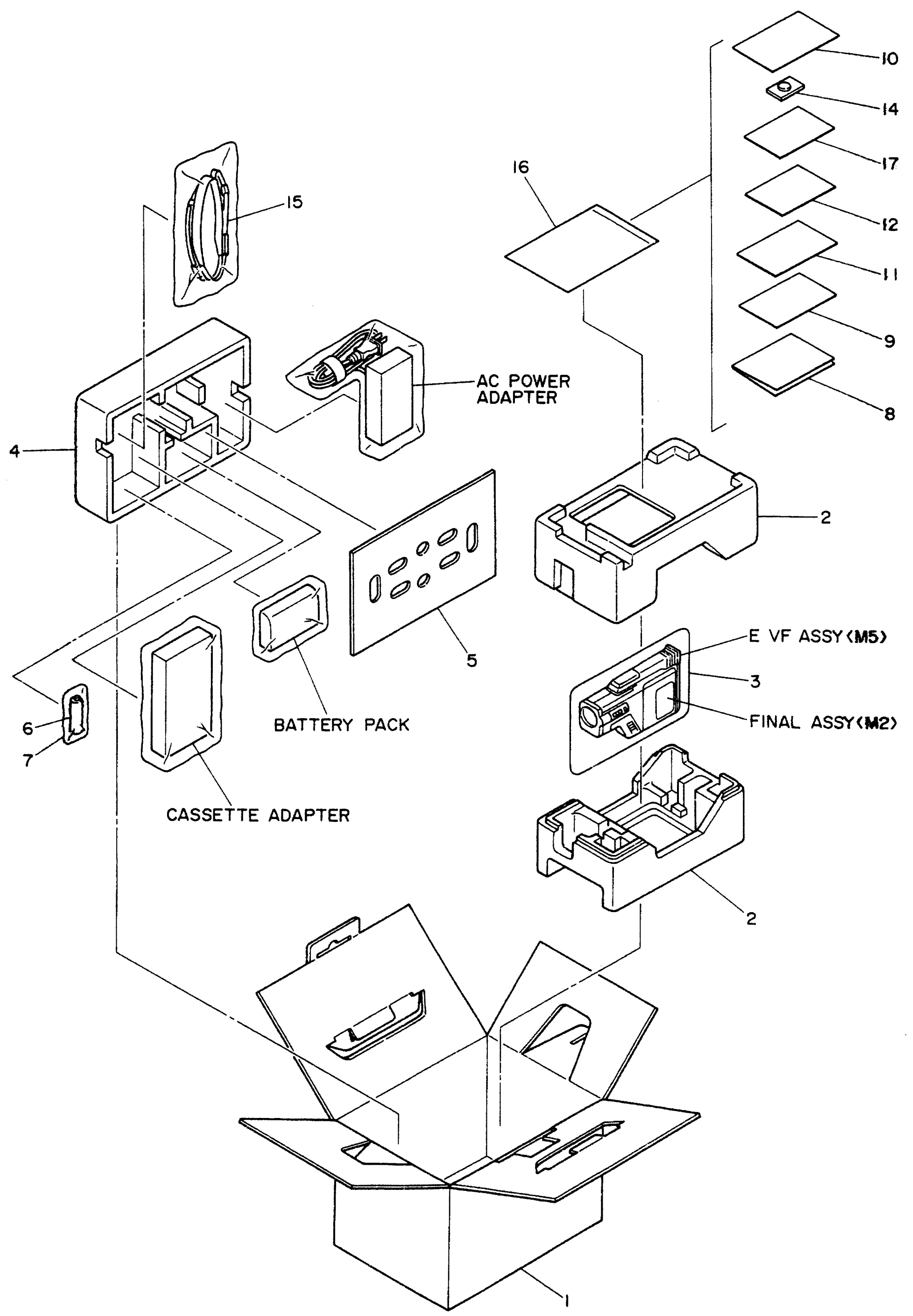
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNiII, MFNiI)
- R Chromium plating (MBCrII, MBCrI)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coated with transparent paint
- A Colored red after galvanizing (MFZnII-C)
- C Colored blue after galvanizing (MFZzII-C)
- T Colored green after galvanizing (MFZnII-C)
- V Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
11
9
8
16
15
AC POWER ADAPTER
4
2
5
E VF ASSY<M5>
3
FINAL ASSY<M2>
6
7
BATTERY PACK
CASSETTE ADAPTER
2
1

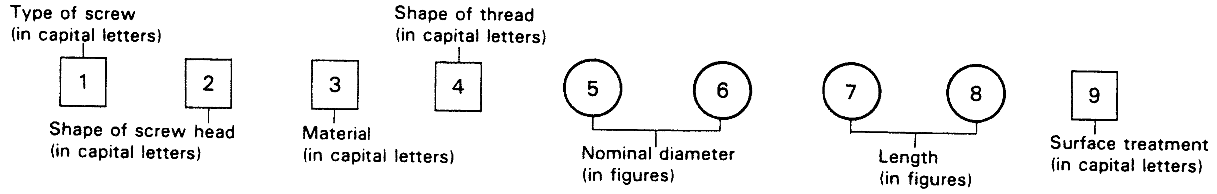
# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
			PACKING ASSEMBLY <01>
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	–	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

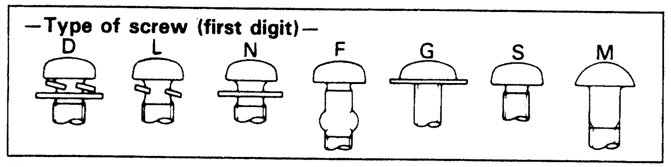
6.1.1 Screw coding

Standard screw part numbers are as follows.


Type of screw
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of thread
(in capital letters)
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

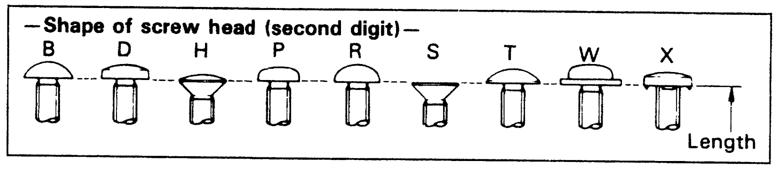
Type of screw (first digit)

S	Normal screws
D	Assembled machine screws (with plain and spring washers)
L	″ (with spring washer)
N	″ (with plain washer)
F	Feather screws
G	Washer head tapping screws
M	Wood screws


—Type of screw (first digit)—
D
L
N
F
G
S
M

Shape of screw head (second digit)

B	Brazier head
D	Binding head
H	Oval countersunk head
P	Pan head
R	Round head
S	Flat head
T	Truss head
W	Washer head (machine screws)
X	Toothed head

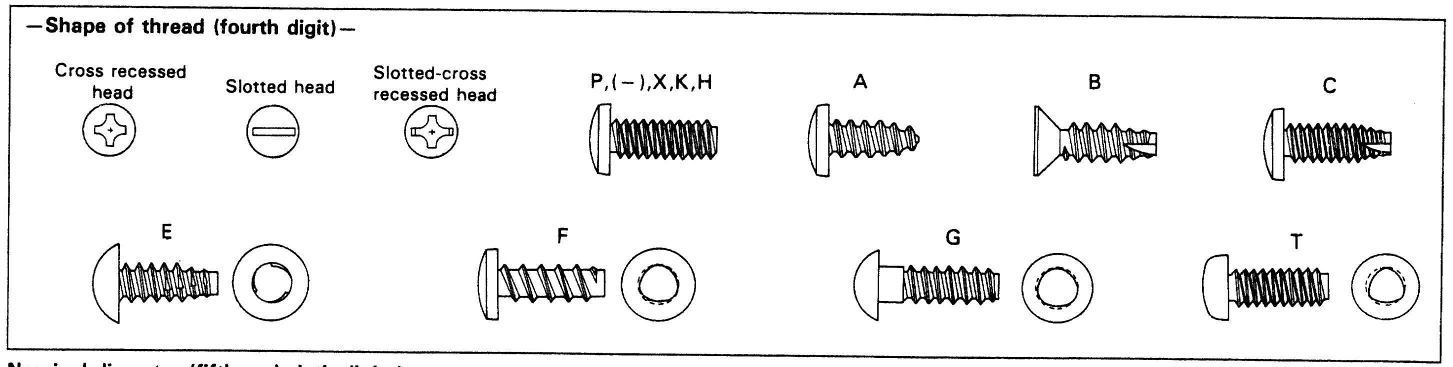

—Shape of screw head (second digit)—
B
D
H
P
R
S
T
W
X
Length

Material (third digit)

S	Steel
E	Stainless steel
C	Cast iron
U	Copper
B	Brass
P	Phosphor bronze
N	Nickel silver
Y	Cast brass
A	Aluminum
Z	Zinc alloy
K	Polycarbonate

Shape of thread (fourth digit)

P	Cross recessed head screws
(−)	Slotted head machine screws
X	Slotted-cross recessed head machine screws
K	Cross recessed head machine screws for precision equipment (type 1)
H	″ (type 3)
A	Cross recessed head tapping screws (type 1)
B	″ (type 2)
C	″ (type 3)
E	Cross recessed head special tapping screws (brand : evertight)
F	″ (brand : P-tight)
T	″ (brand : taptight)
G	″


—Shape of thread (fourth digit)—
Cross recessed head
Slotted head
Slotted-cross recessed head
P,(−),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

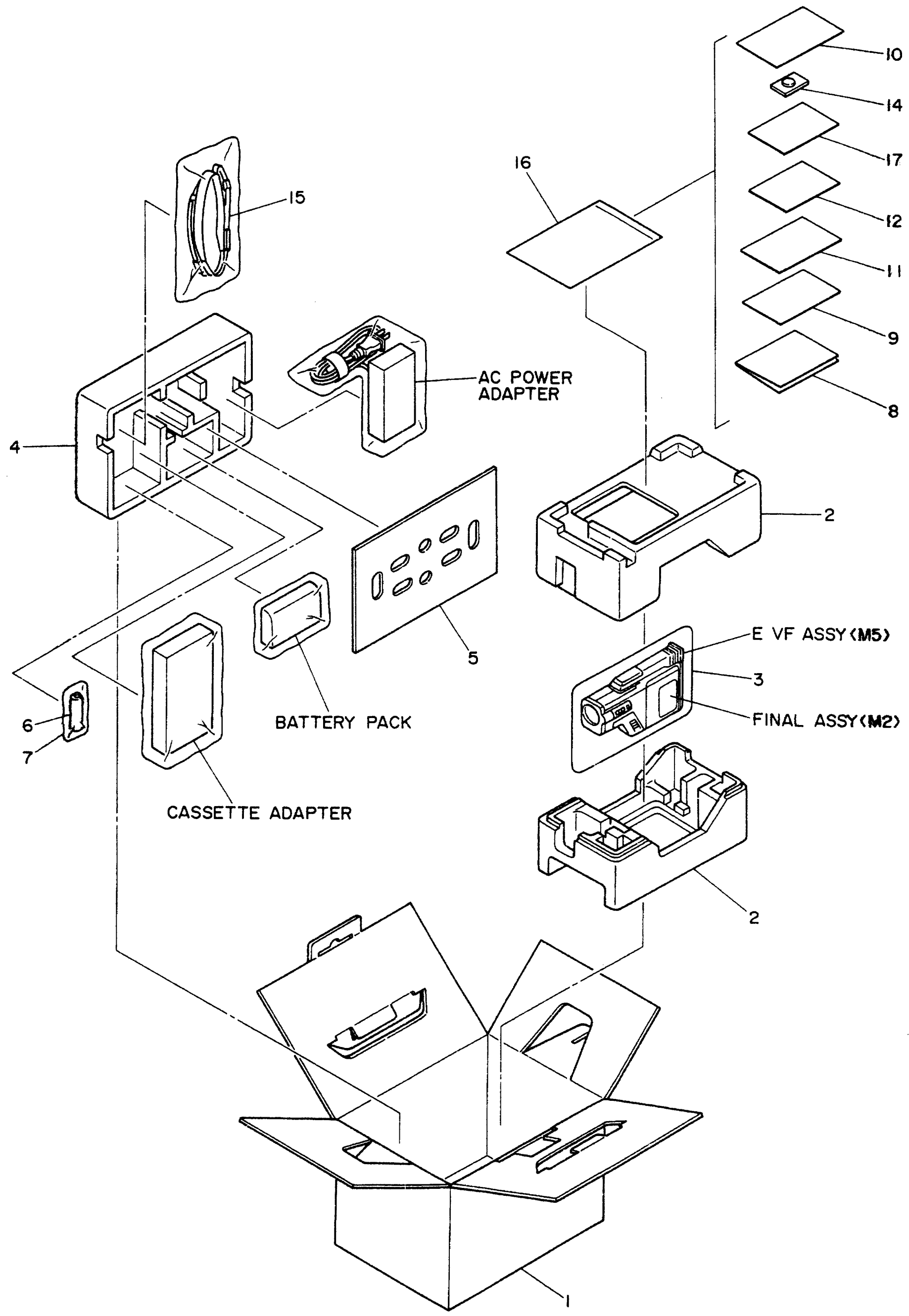
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

Z	Dichromate treatment after galvanizing (MFZn II-C)
N	Nickel plating (MFNiII, MFNiI)
R	Chromium plating (MBCrII, MBCrI)
G	Silver plating (SP4)
B	Black coating after plating
F	Blackening of iron (FB)
M	Blackening after galvanizing
K	Pickling of brass (PF2)
P	Phosphate treatment
W	Uni-chrome plating
L	Coated with transparent paint
A	Colored red after galvanizing (MFZnII-C)
C	Colored blue after galvanizing (MFZzII-C)
T	Colored green after galvanizing (MFZnII-C)
V	Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
11
9
8
16
15
AC POWER ADAPTER
4
2
5
E VF ASSY<M5>
3
FINAL ASSY<M2>
6
7
BATTERY PACK
CASSETTE ADAPTER
2
1

PACKING ASSEMBLY <01>

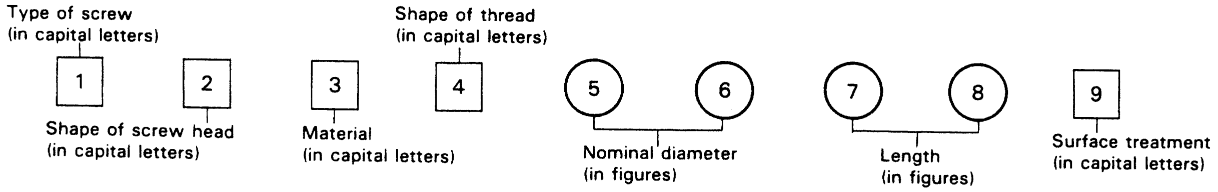
# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	−	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

6.1.1 Screw coding

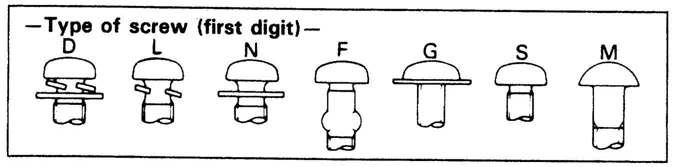
Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L 〃 (with spring washer)
- N 〃 (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

—Type of screw (first digit)—



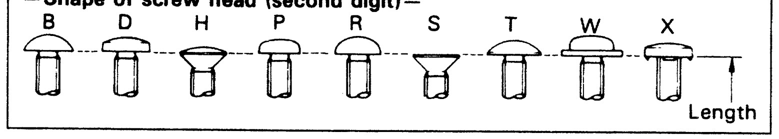
Material (third digit)

- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head

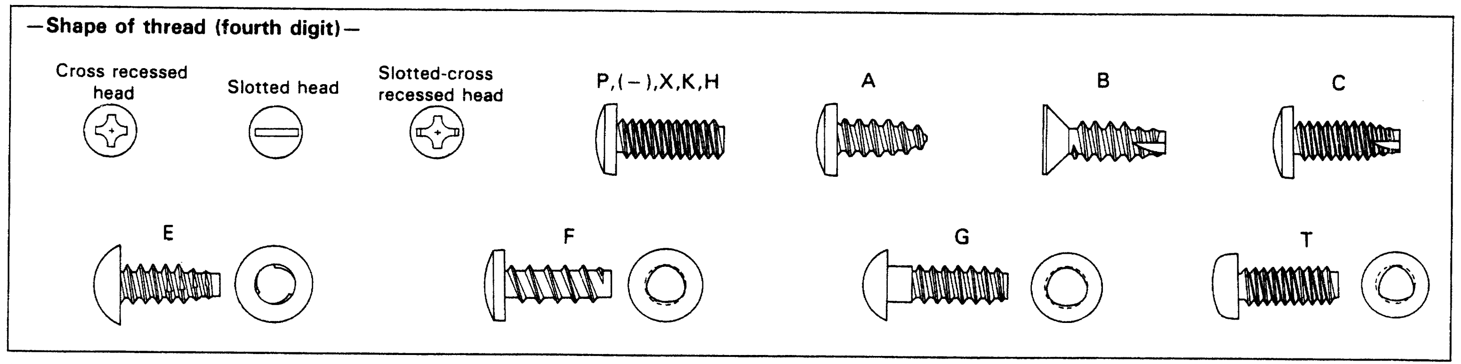
—Shape of screw head (second digit)—


B
D
H
P
R
S
T
W
X
Length

Shape of thread (fourth digit)

- P Cross recessed head screws
- (−) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H 〃 (type 3)
- A Cross recessed head tapping screws (type 1)
- B 〃 (type 2)
- C 〃 (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F 〃 (brand : P-tight)
- T 〃 (brand : taptight)
- G 〃

—Shape of thread (fourth digit)—


Cross recessed
head
Slotted head
Slotted-cross
recessed head
P,(−),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

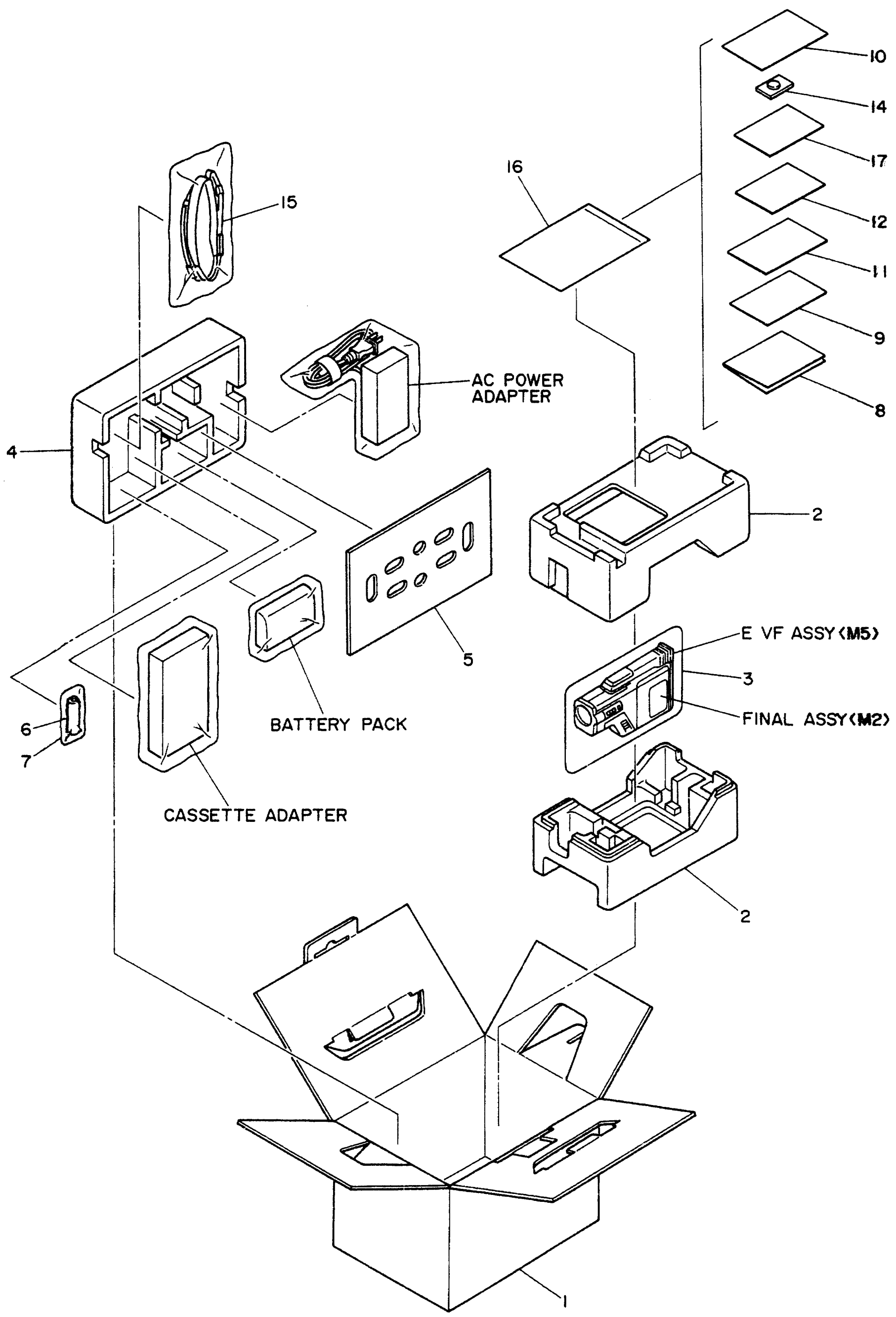
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNiII, MFNiI)
- R Chromium plating (MBCrII, MBCrI)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coated with transparent paint
- A Colored red after galvanizing (MFZnII-C)
- C Colored blue after galvanizing (MFZzII-C)
- T Colored green after galvanizing (MFZnII-C)
- V Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
11
9
8
16
15
AC POWER
ADAPTER
4
2
E VF ASSY<M5>
3
FINAL ASSY<M2>
5
BATTERY PACK
6
7
CASSETTE ADAPTER
2
1

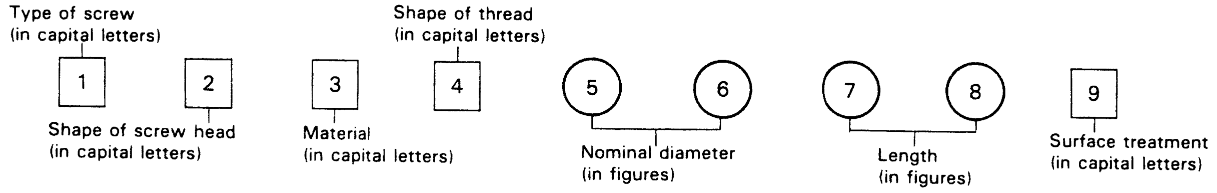
# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
			PACKING ASSEMBLY <01>
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	–	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

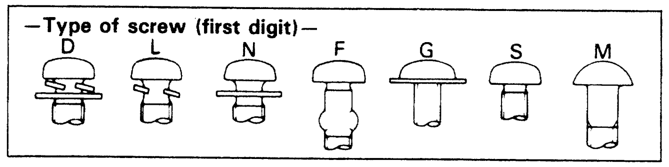
6.1.1 Screw coding

Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

Type of screw (first digit)

S	Normal screws
D	Assembled machine screws (with plain and spring washers)
L	″ (with spring washer)
N	″ (with plain washer)
F	Feather screws
G	Washer head tapping screws
M	Wood screws

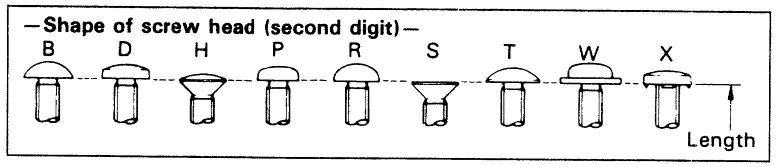

—Type of screw (first digit)—
D
L
N
F
G
S
M

Material (third digit)

S	Steel
E	Stainless steel
C	Cast iron
U	Copper
B	Brass
P	Phosphor bronze
N	Nickel silver
Y	Cast brass
A	Aluminum
Z	Zinc alloy
K	Polycarbonate

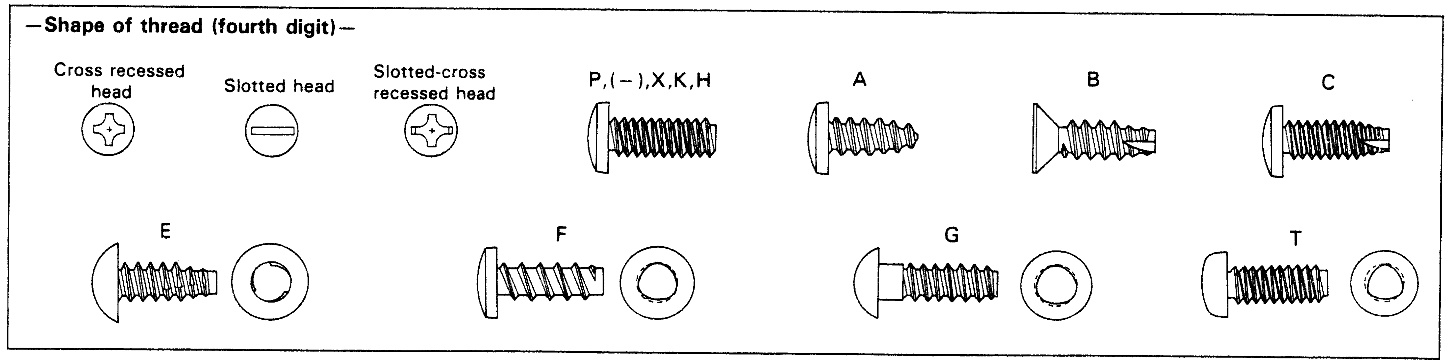
Shape of screw head (second digit)

B	Brazier head
D	Binding head
H	Oval countersunk head
P	Pan head
R	Round head
S	Flat head
T	Truss head
W	Washer head (machine screws)
X	Toothed head


—Shape of screw head (second digit)—
B
D
H
P
R
S
T
W
X
Length

Shape of thread (fourth digit)

P	Cross recessed head screws
(–)	Slotted head machine screws
X	Slotted-cross recessed head machine screws
K	Cross recessed head machine screws for precision equipment (type 1)
H	″ (type 3)
A	Cross recessed head tapping screws (type 1)
B	″ (type 2)
C	″ (type 3)
E	Cross recessed head special tapping screws (brand : evertight)
F	″ (brand : P-tight)
T	″ (brand : taptight)
G	″


—Shape of thread (fourth digit)—
Cross recessed head
Slotted head
Slotted-cross recessed head
P,(–),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

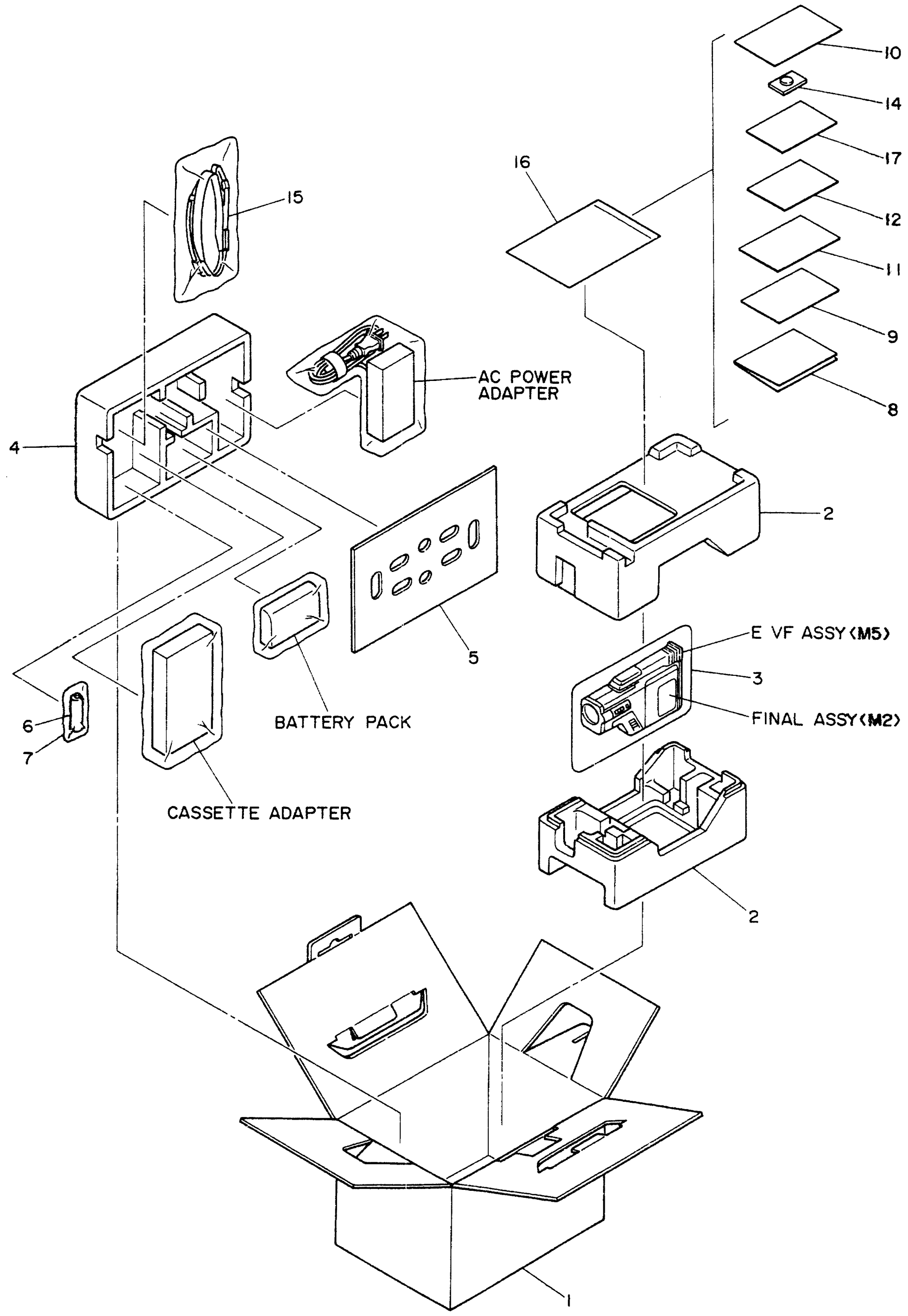
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

Z	Dichromate treatment after galvanizing (MFZn II-C)
N	Nickel plating (MFNiII, MFNiI)
R	Chromium plating (MBCrII, MBCrI)
G	Silver plating (SP4)
B	Black coating after plating
F	Blackening of iron (FB)
M	Blackening after galvanizing
K	Pickling of brass (PF2)
P	Phosphate treatment
W	Uni-chrome plating
L	Coated with transparent paint
A	Colored red after galvanizing (MFZnII-C)
C	Colored blue after galvanizing (MFZzII-C)
T	Colored green after galvanizing (MFZnII-C)
V	Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
11
9
8
16
15
AC POWER ADAPTER
4
2
5
E VF ASSY(M5)
3
FINAL ASSY(M2)
6
7
BATTERY PACK
CASSETTE ADAPTER
2
1

PACKING ASSEMBLY <01>

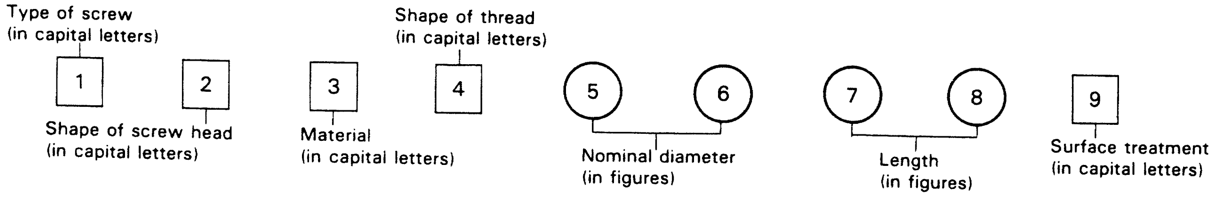
# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	–	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

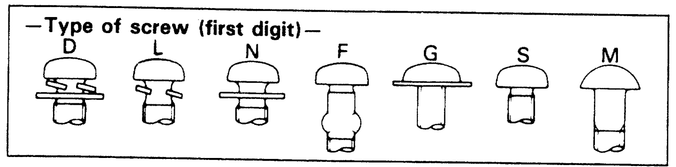
6.1.1 Screw coding

Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L ″ (with spring washer)
- N ″ (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

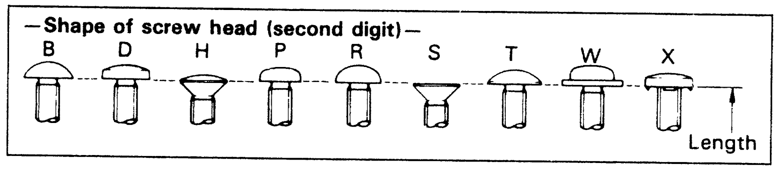

—Type of screw (first digit)—
D
L
N
F
G
S
M

Material (third digit)

- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

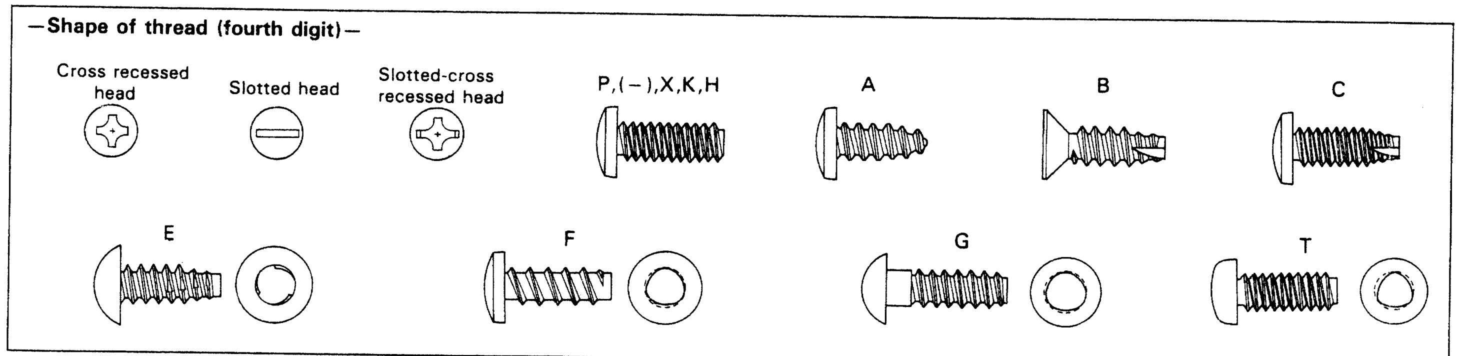
Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head


—Shape of screw head (second digit)—
B
D
H
P
R
S
T
W
X
Length

Shape of thread (fourth digit)

- P Cross recessed head screws
- (−) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H ″ (type 3)
- A Cross recessed head tapping screws (type 1)
- B ″ (type 2)
- C ″ (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F ″ (brand : P-tight)
- T ″ (brand : taptight)
- G ″


—Shape of thread (fourth digit)—
Cross recessed head
Slotted head
Slotted-cross recessed head
P,(−),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

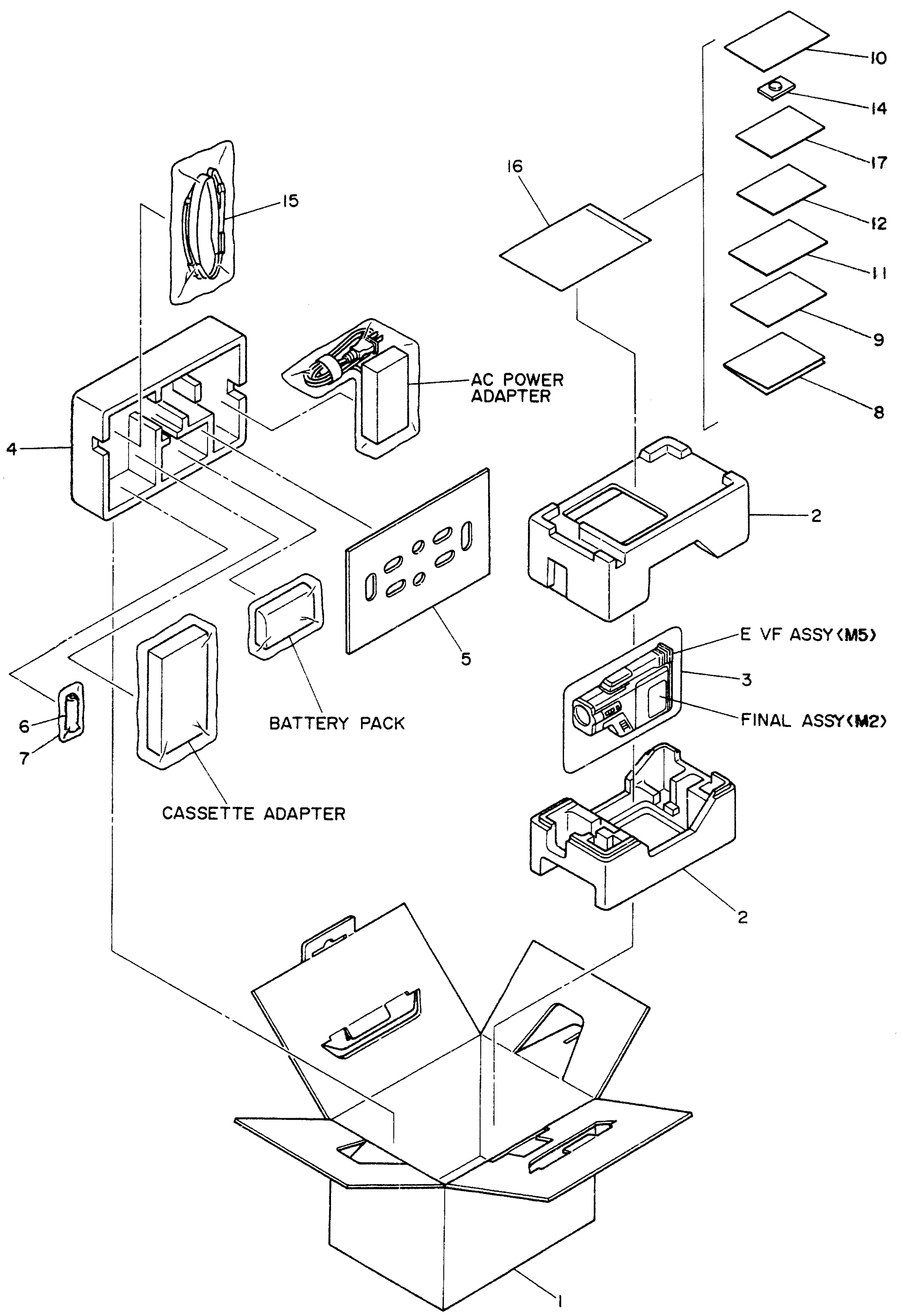
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNiII, MFNiI)
- R Chromium plating (MBCrII, MBCrI)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coated with transparent paint
- A Colored red after galvanizing (MFZnII-C)
- C Colored blue after galvanizing (MFZzII-C)
- T Colored green after galvanizing (MFZnII-C)
- V Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
11
9
8
16
15
AC POWER ADAPTER
4
2
E VF ASSY<M5>
3
FINAL ASSY<M2>
5
6
7
BATTERY PACK
CASSETTE ADAPTER
2
1

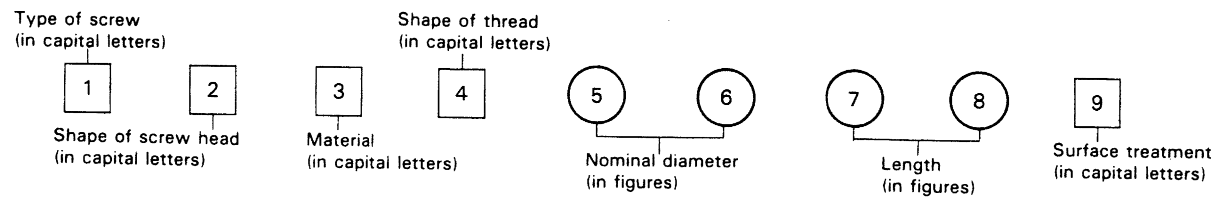
# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
			PACKING ASSEMBLY <01>
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	–	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

6.1.1 Screw coding

Standard screw part numbers are as follows.

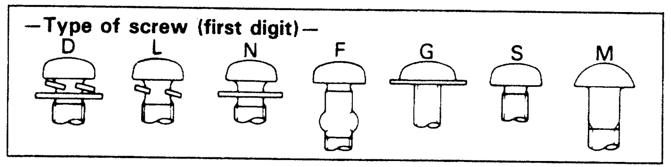

Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

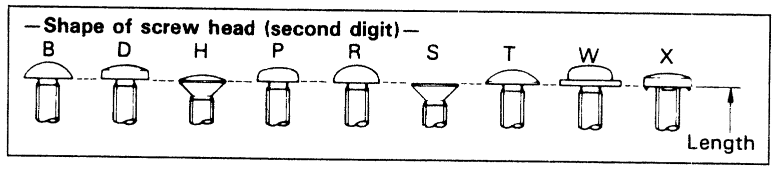
Type of screw (first digit)

S Normal screws
D Assembled machine screws (with plain and spring washers)
L ″ (with spring washer)
N ″ (with plain washer)
F Feather screws
G Washer head tapping screws
M Wood screws

Shape of screw head (second digit)

B Brazier head
D Binding head
H Oval countersunk head
P Pan head
R Round head
S Flat head
T Truss head
W Washer head (machine screws)
X Toothed head


—Type of screw (first digit)—
D
L
N
F
G
S
M

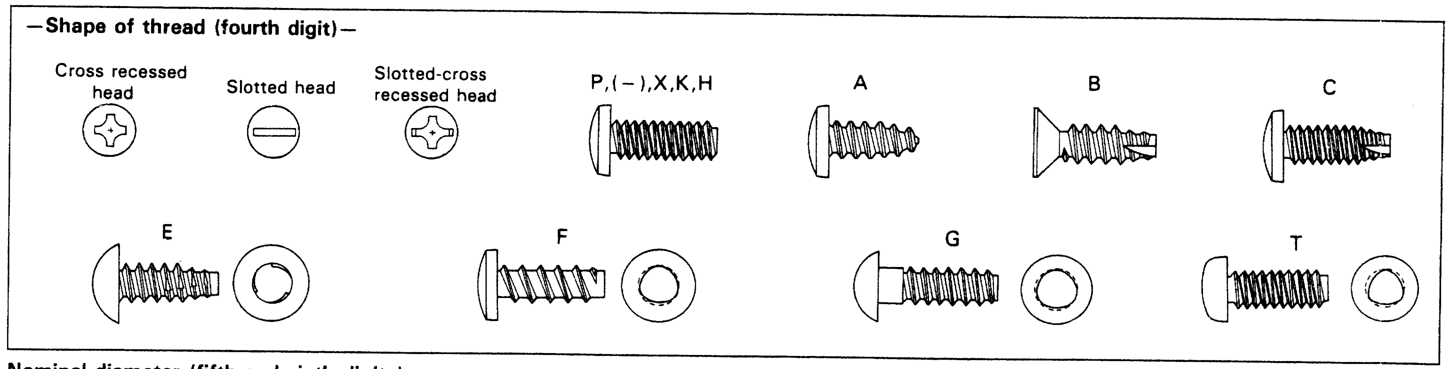

—Shape of screw head (second digit)—
B
D
H
P
R
S
T
W
X
Length

Material (third digit)

S Steel
E Stainless steel
C Cast iron
U Copper
B Brass
P Phosphor bronze
N Nickel silver
Y Cast brass
A Aluminum
Z Zinc alloy
K Polycarbonate

Shape of thread (fourth digit)

P Cross recessed head screws
(–) Slotted head machine screws
X Slotted-cross recessed head machine screws
K Cross recessed head machine screws for precision equipment (type 1)
H ″ (type 3)
A Cross recessed head tapping screws (type 1)
B ″ (type 2)
C ″ (type 3)
E Cross recessed head special tapping screws (brand : evertight)
F ″ (brand : P-tight)
T ″ (brand : taptight)
G ″


—Shape of thread (fourth digit)—
Cross recessed head
Slotted head
Slotted-cross recessed head
P,(–),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

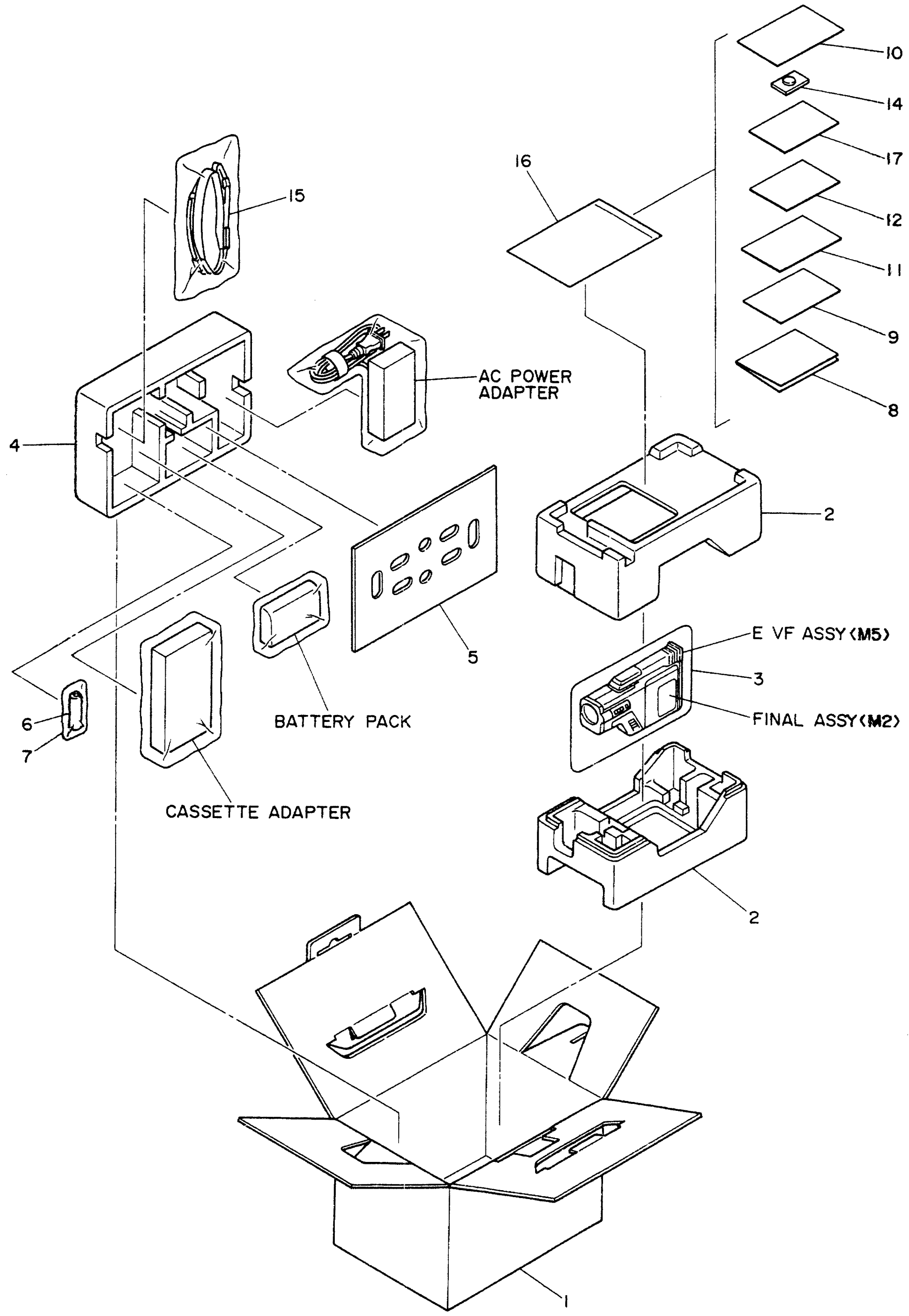
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

Z Dichromate treatment after galvanizing (MFZn II-C)
N Nickel plating (MFNiII, MFNiI)
R Chromium plating (MBCrII, MBCrI)
G Silver plating (SP4)
B Black coating after plating
F Blackening of iron (FB)
M Blackening after galvanizing
K Pickling of brass (PF2)
P Phosphate treatment
W Uni-chrome plating
L Coated with transparent paint
A Colored red after galvanizing (MFZnII-C)
C Colored blue after galvanizing (MFZzII-C)
T Colored green after galvanizing (MFZnII-C)
V Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
11
9
8
16
15
AC POWER ADAPTER
4
2
5
E VF ASSY<M5>
3
FINAL ASSY<M2>
6
7
BATTERY PACK
CASSETTE ADAPTER
2
1

PACKING ASSEMBLY <01>

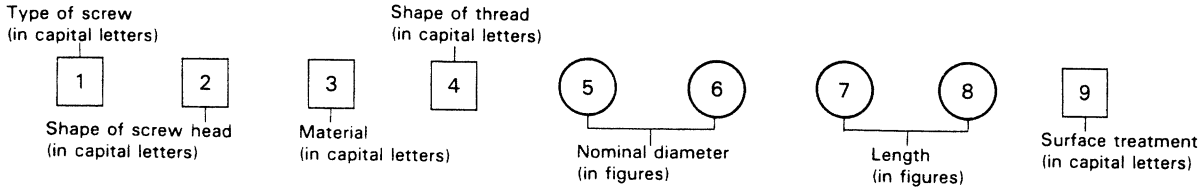
# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	–	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

SECTION 6
EXPLODED VIEWS AND PARTS LIST

6.1 STANDARD PART NUMBER CODING

6.1.1 Screw coding

Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

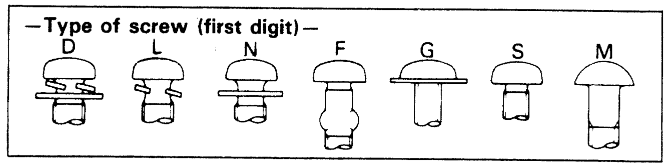
Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L 〃 (with spring washer)
- N 〃 (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

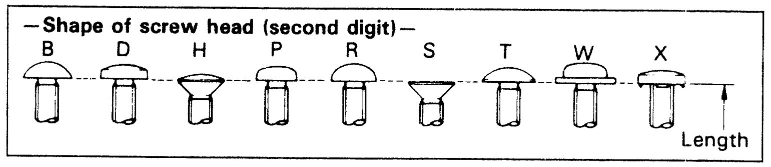
Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head

—Type of screw (first digit)—



—Shape of screw head (second digit)—


B
D
H
P
R
S
T
W
X
Length

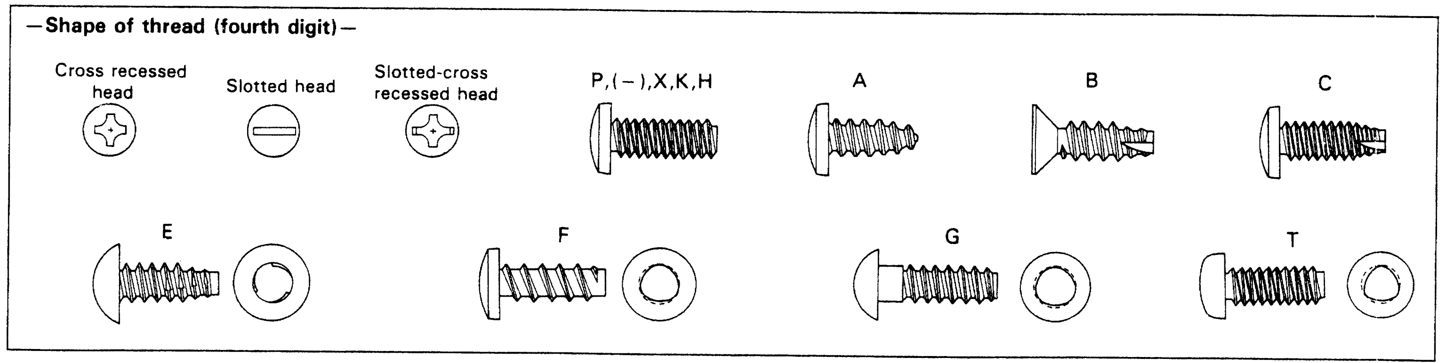
Material (third digit)

- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of thread (fourth digit)

- P Cross recessed head screws
- (−) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H 〃 (type 3)
- A Cross recessed head tapping screws (type 1)
- B 〃 (type 2)
- C 〃 (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F 〃 (brand : P-tight)
- T 〃 (brand : taptight)
- G 〃

—Shape of thread (fourth digit)—


Cross recessed head
Slotted head
Slotted-cross recessed head
P,(−),X,K,H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

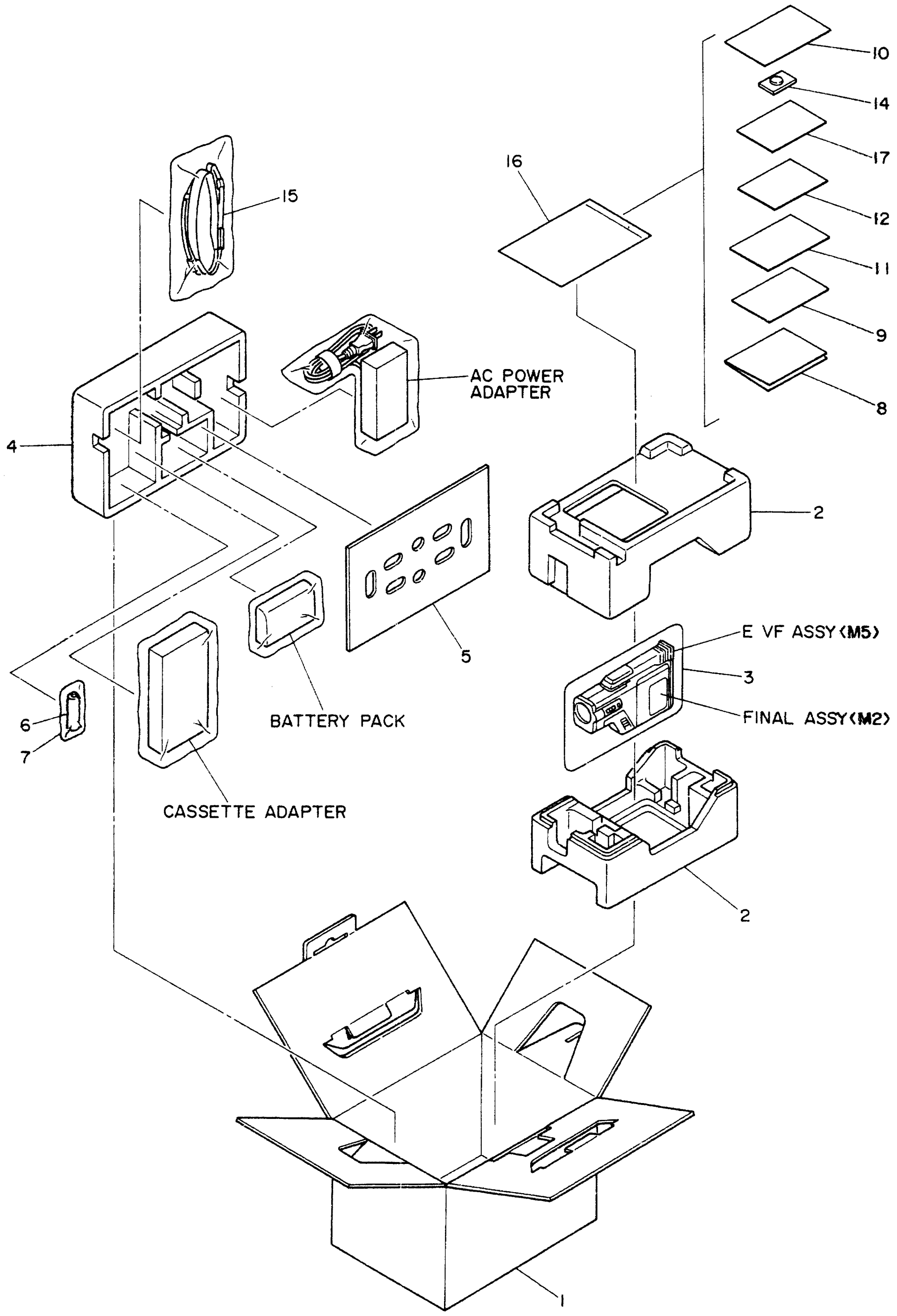
Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNiII, MFNiI)
- R Chromium plating (MBCrII, MBCrI)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coated with transparent paint
- A Colored red after galvanizing (MFZnII-C)
- C Colored blue after galvanizing (MFZzII-C)
- T Colored green after galvanizing (MFZnII-C)
- V Colored purple after galvanizing (MFZnII-C)

6.2 PACKING ASSEMBLY <M1>


10
14
17
12
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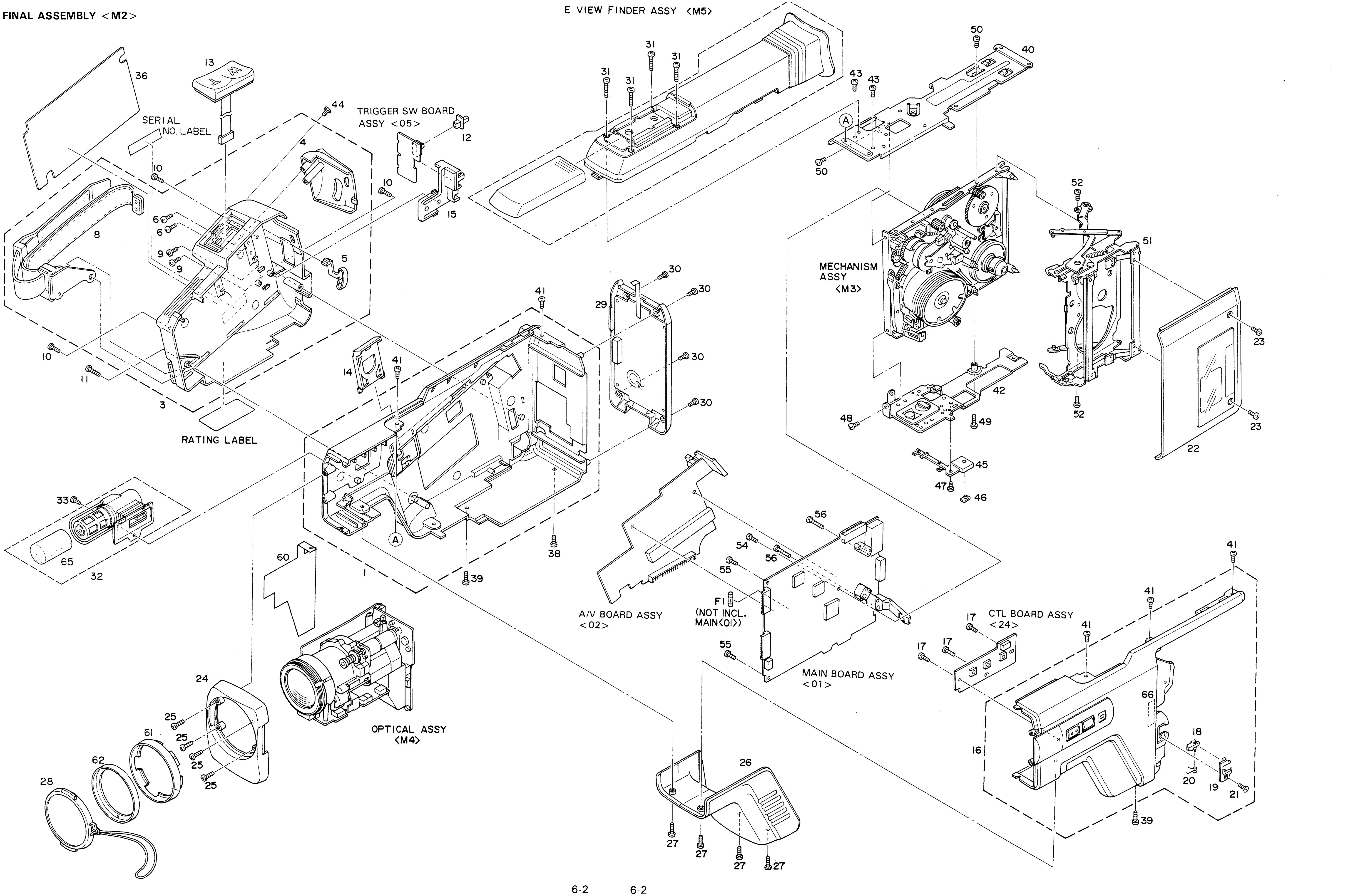
8
16
15
AC POWER ADAPTER
4
2
5
BATTERY PACK
E VF ASSY<M5>
3
FINAL ASSY<M2>
6
7
CASSETTE ADAPTER
2
1

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
			PACKING ASSEMBLY <01>
	1	YU30199-3	PACKING CASE, FOR EG
		YU30199-4	PACKING CASE, FOR EK
	2	YU30197A-3	CUSHION ASSY
	3	YQM30021-10	POLY BAG
	4	YQ20159	ACCESSORY TRAY
	5	YQ40878	ACCESSORY TRAY SHEET
	6	UM-3DJ	BATTERY
	7	PQM30021-48	POLY BAG
⚠	8	YU30052-41	INSTRUCTIONS,FOR EG
⚠		YU30052-42	INSTRUCTIONS,FOR EK
⚠	9	–	DBP INF SHEET,FOR EG
	10	BT-20060	GUARANTEE CARD,FOR EK
	11	TCN-3379	TAPE CATALOGUE
	12	YU40406-6	MARKET.SHEET,FOR EK
⚠	14	YU40547	BATTERY
⚠	15	YQ10051A-3	SHOULDER STRAP
	16	QPGA025-03505	POLY BAG,FOR EG
	16	PQM30023-5	POLY BAG,FOR EK
	17	BT-20066	E.DISTRI.LIST,FOR EK

6.2 FINAL ASSEMBLY <M2>


E VIEW FINDER ASSY <M5>
TRIGGER SW BOARD ASSY <05>
SERIAL NO. LABEL
RATING LABEL
MECHANISM ASSY <M3>
A/V BOARD ASSY <02>
F1 (NOT INCL. MAIN<01>)
MAIN BOARD ASSY <01>
CTL BOARD ASSY <24>
OPTICAL ASSY <M4>
A
A
1
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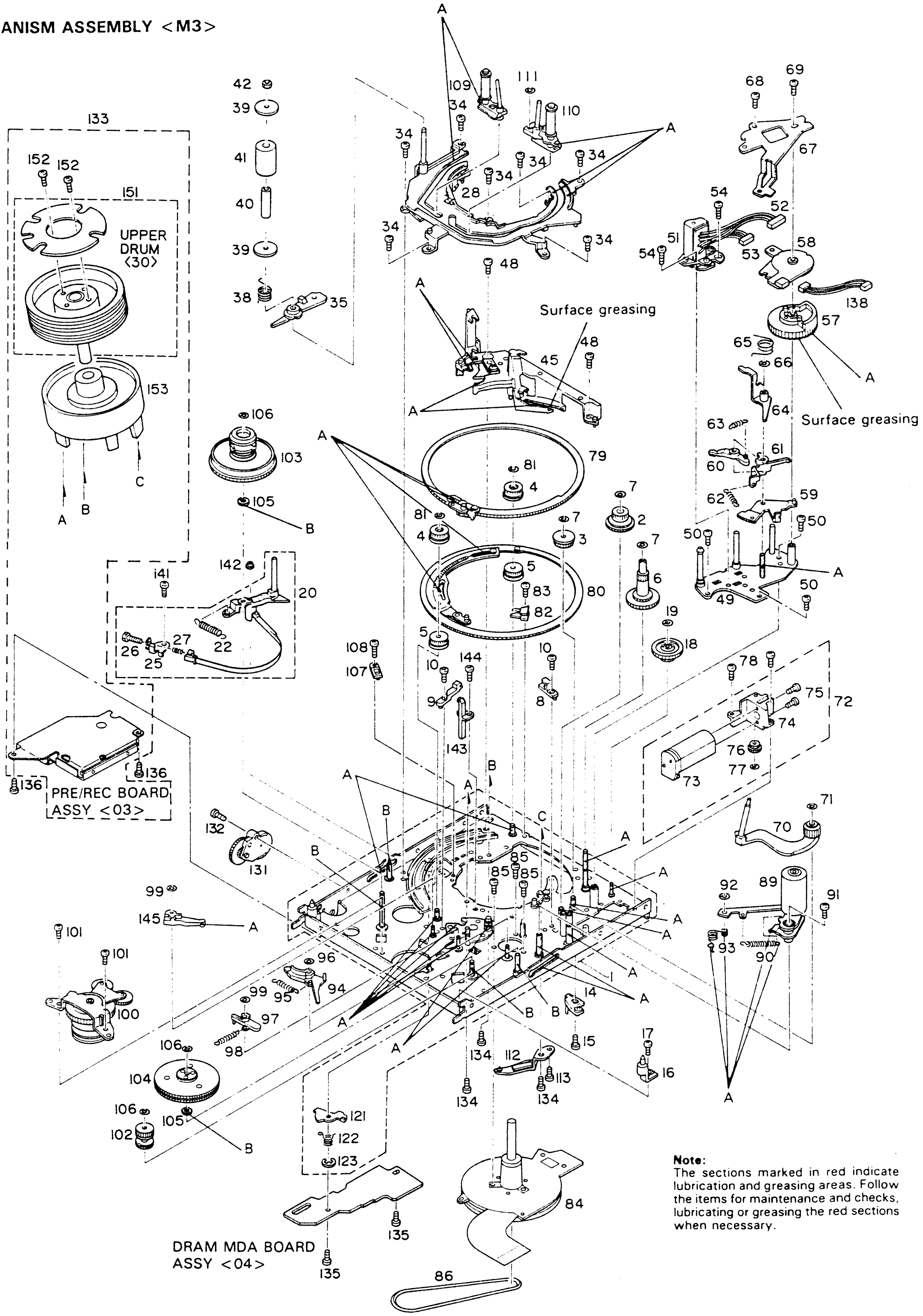
FINAL ASSEMBLY <M2>

#	⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	⚠	1	YQ10097P-6	LOWER CASE ASSY
	⚠	3	YQ10098P-6	BATTERY BASE ASSY,INCL.4-6,8,9
		4	YQ30243-2-4	FINGER REST
		5	YQ30236-1-2	BUTTO(TRIGGER)
		6	YQM30032-4-2	SPECIAL SCREW, X2
		8	YQ20136B	GRIP BELT ASSY
		9	YQM30032-5-2	SPECIAL SCREW, X2
		10	YQM30032-4-2	SPECIAL SCREW, X3
		11	YQM30032-27	SPECIAL SCREW
		12	YQ40696-1-3	ALARM KNOB
		13	YU40714	ZOOM SWITCH
		14	YQ30234-1-4	BATTERY HOLDER
		15	YQ30241-1-4	TRIGGER BOARD HOLDER
	⚠	16	YQ10099P-3	UPPER CASE ASSY,INCL.18-21,66
		17	YQM30032-2-2	SPECIAL SCREW, X3
		18	YQ30109-1-1	TAPE GUID(D)
		19	YQ30110	TAPE GUIDE HOLDER
		20	YQ40451	TORSION SPRING
		21	SSSG1740M	SCREW
	⚠	22	YQ20148E-9	CASSETTE COVER ASSY
		23	YQM30032-1-2	SPECIAL SCREW, X2
	⚠	24	YQ30240-14-3	FRONT PANEL
		25	YQM30032-27	SPECIAL SCREW, X4
	⚠	26	YQ30381A	FRONT PAD ASSY
		27	YQM30032-16-2	SPECIAL SCREW, X4
		28	YQ40834A-1	HOOD CAP ASSY
	⚠	29	YQ20149-4-5	OPERATION UNIT
		30	YQM30032-4-2	SPECIAL SCREW, X4
		31	YQM30032-26	SPECIAL SCREW, X4
		32	YU40715P-1	MICROPHONE
		33	YQM30032-4-2	SPECIAL SCREW
	⚠	36	YU20063-2	BATTERY BASE SHEET
		38	YQM30032-1-2	SPECIAL SCREW
		39	YQM30032-16-2	SPECIAL SCREW, X2
		40	YQ20124-1-3	FRAME BKT
		41	YQM30032-1-2	SPECIAL SCREW, X5
		42	YQ30239A-3	BASE BKT ASSY
		43	YQM30032-4-2	SPECIAL SCREW, X2
		44	YQM30032-4-2	SPECIAL SCREW
		45	YQ30301-1-3	END SENSOR BRACKET
		46	TPS605	PHOTO TRANSISTOR
		47	SPSH1725M	SCREW
		48	YQ40691	SPECIAL SCREW
		49	SPSK1780M	SCREW
		50	SPSH1725M	SCREW, X2
		51	YQ20068C	CASSETTE HOUSING ASSY
		52	SPSK1730M	SCREW, X2
		54	YQ40691	SPECIAL SCREW
		55	SPSH1725M	SCREW, X2
		56	SPSH1714M	SCREW, X2
		60	YQ40952	SHIELD PLATE
		61	YQ41098A-1	HOOD
		62	YQ40948	HOOD LOCK RING
		65	YU40715-001	WIND SCREEN
		66	YQM30029-14	SPACER

6.4 MECHANISM ASSEMBLY <M3>


A
109
111
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Surface greasing
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133
152
152
151
UPPER
DRUM
<30>
153
A
B
C
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105
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142
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107
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143
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136
PRE/REC BOARD
ASSY <03>
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102
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135
DRAM MDA BOARD
ASSY <04>
84
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138
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Surface greasing
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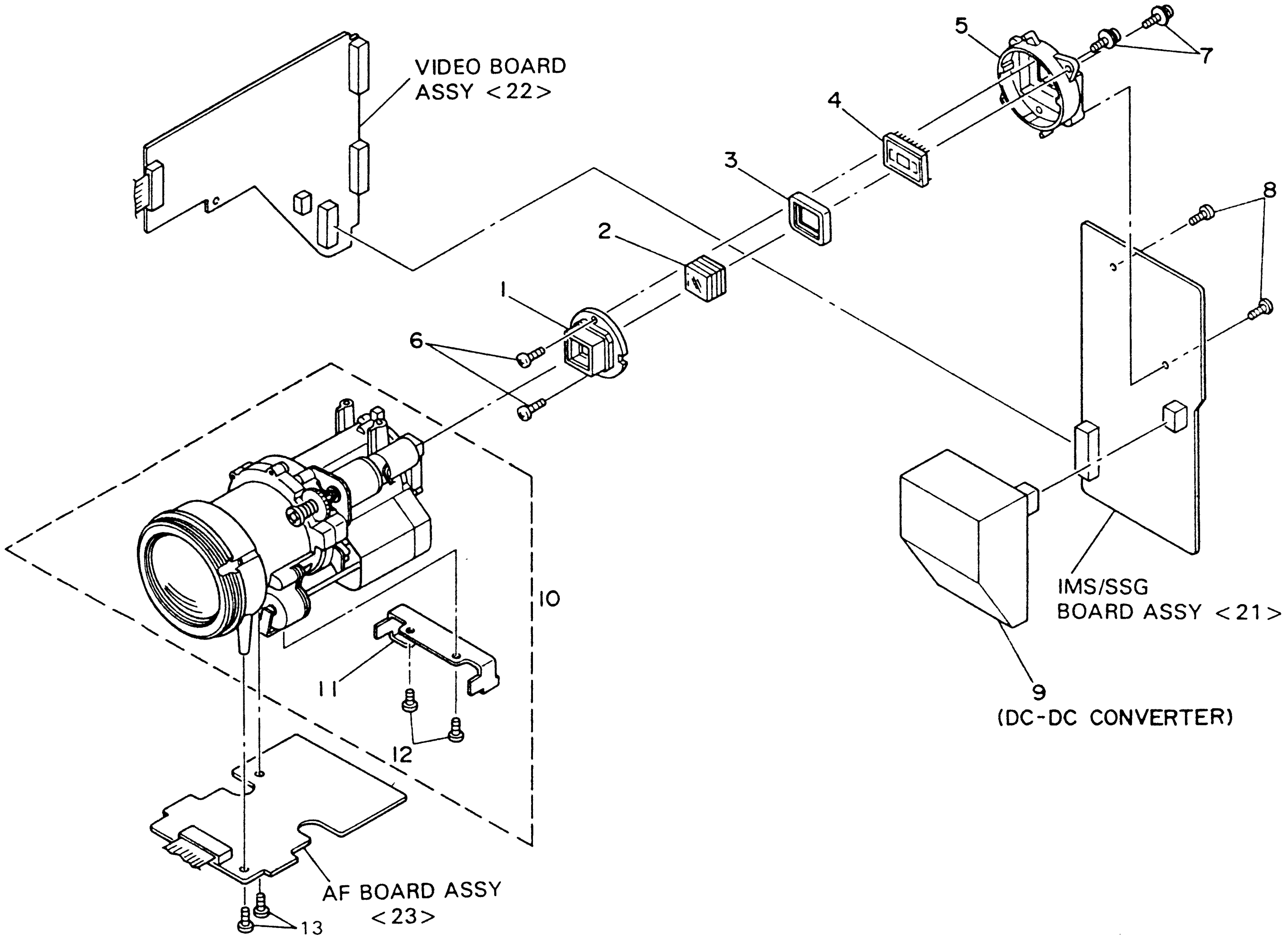
Note:
The sections marked in red indicate lubrication and greasing areas. Follow the items for maintenance and checks, lubricating or greasing the red sections when necessary.

MECHANISM ASSEMBLY <M3>

# △	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ10089A-7	MAIN DECK ASSY,INCL.121-123
	2	YQ40744	LOADING GEAR 1
	3	YQ40123	LOADING GEAR 2
	4	YQ40124	RING G.GEA(S), X2
	5	YQ40125-2	RING G.GEA(T), X2
	6	YQ30271	TERMINAL GEAR
	7	PQM30017-27	SLIT WASHER, X3
	8	YQ40746	RING GUIDE 1
	9	YQ40128	RING GUIDE 3
	10	SPSH1725M	SCREW, X2
	14	YQ40886	LOADING GUIDE
	15	SPSH1740M	SCREW
	16	YQ40801-1-4	GUIDE PIN
	17	SPSH1725M	SCREW
	18	YQ40750	MIDDLE GEAR
	19	PQM30017-27	SLIT WASHER
	20	Q40389B	T.SERVO ASSY,INCL.22,25-27
	22	YQM30001-30	TENSION SPRING
	25	YQ40056-2	BAND HOLDER A
	26	SPSK1780M	MINI SCREW
	27	YQM30002-1	COMPRESS.SPRING
	28	YQ40759A-3	G.RAIL ASSY
	34	SPSH1725M	SCREW, X7
	35	YQ20050-1-7	FULL ERASE HEAD ARM
	38	YQ40391-1-2	TORSION SPRING
	39	YQ40063	FLANGE, X2
	40	YQ40064-1-1	COLLAR
	41	YQ41121	IMPEDANCE ROLLER
	42	NTS2000N	NUT
	45	YQ40762A-3	UV BASE ASSY
	48	SPSH1730M	MINI SCREW, X2
	49	YQ40763A-5	SUB DECK ASSY
	50	SPSH1725M	SCREW, X3
	51	YU40711-1-1	AUDIO/CONTROL HEAD ASSY
	52	ML-Y00166A-1	A/C-A/V WIRE ASSY
	53	ML-Y00167A	A/C M.WIRE ASSY
	54	YQ40904A-1	ALOCK SCREW, X2
	57	YQ20057-1-2	CAM GEAR
	58	YU40619	CAM ENCODER
	59	YQ40769A-3	ARM GEAR ASSY
	60	YQ40358	LOCK ARM 1
	61	YQ40771	LOCK ARM 2
	62	YQ40342	TENSION SPRING
	63	YQ40362	TENSION SPRING
	64	YQ40772A-1	LOCK ARM 3 ASSY
	65	YQ41113	TORSION SPRING
	66	PQM30017-25	SLIT WASHER
	67	YQ30266-1-4	MIDDLE POLE STOPPER
	68	SPSH1725M	SCREW
	69	SPSH1780M	SCREW
	70	YQ40774A	MIDDLE POLE ASSY
	71	PQM30017-23	SLIT WASHER
△	72	YQ30283A-3	MC M.BRACKET ASSY,INCL.73-77
△	73	YU40712V-1	MODE CTL MOTOR
	74	YQ40777A-1	MODE CTL M.BRACKET
	75	SPSH1425M	SCREW, X2
	76	YQ40778	WORM WHEEL
	77	PQM30017-27	SLIT WASHER
	78	SPSH1730M	MINI SCREW, X2
	79	YQ40779A	SUP LOADING RING ASSY
	80	YQ40781A-3	TU LOADING RING ASSY
	81	PQM30017-27	SLIT WASHER, X2
	82	YQ40784	RING GUIDE 2
	83	SPSH1725M	SCREW
△	84	YU41028V	CAPSTAN MOTOR ASSY
	85	SPSH1730M	MINI SCREW, X3
	86	YQM30003-3	BELT
	89	YQ40785A-1	PINCH ROLLER ARM ASSY
	OR	YQ40785B-1	PINCH ROLLER ARM ASSY
	90	YQ40793	TENSION SPRING
	91	PQ41535-4	SCREW
	92	PQM30017-27	SLIT WASHER
	93	YQ40794-1-1	TORSION SPRING
	94	YQ30269	TU BRAKE LEVER
	95	YQ40796-1-2	TENSION SPRING
	96	PQM30017-27	SLIT WASHER
	97	YQ30270	SEARCH BRAKE LEVER
	98	YQ40798-1-1	TENSION SPRING
	99	PQM30017-27	SLIT WASHER, X2
	100	YU40622-1-2	CENTER PULLEY BRACKET ASSY
	101	SPSH1725M	SCREW, X2
	102	YQ40147-1-1	TAKE UP GEAR
	103	YU40623-1-1	SUP.REEL DISC.ASSY
	104	YU40624-1-1	TU.CLUTCH ASSY
	105	Q03093-835	WASHER, X2
	106	PQM30017-27	SLIT WASHER, X3
	107	YU40234	DEW SENSOR
	108	SPSH1725M	SCREW
	109	YQ40083C-7	SUP POLE BASE ASSY
	110	YQ40799B	TU POLE BASE ASSY
	111	PQM30017-27	SLIT WASHER
	112	YU40716	BRUSH
	113	SPSH1730M	MINI SCREW
	121	YQ40737-1-2	EJECT LEVER
	122	YQ40739-1-3	TORSION SPRING
	123	REE4000	E REING
	131	YU40788	DAMPER
	132	SPSH1760M	SCREW
△	133	YDV2012A	DRUM ASSY,INCL.PRE AMP,151-153
	134	SPSH1730M	MINI SCREW, X3
	135	PQ41450-2	SCREW, X2
	136	SPSH1720M	SCREW, X2
	138	ML-Y00158A	M.CTL S.WIRE AS
	141	SPSH1725M	SCREW
	142	YQ40059	CAP
	143	YQ40831-1-1	LED GUIDE
	144	SPSH1725M	SCREW
	145	YQ30322-1-1	S.BRAKE LINK
	151	YDM2018B	UPPER DRUM ASSY
	152	YDM4031	SCREW, X2
	153	YDM2020A	LOWER DRUM MOTOR ASSY

6.5 OPTICAL BLOCK ASSEMBLY <M4>


VIDEO BOARD ASSY <22>
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1
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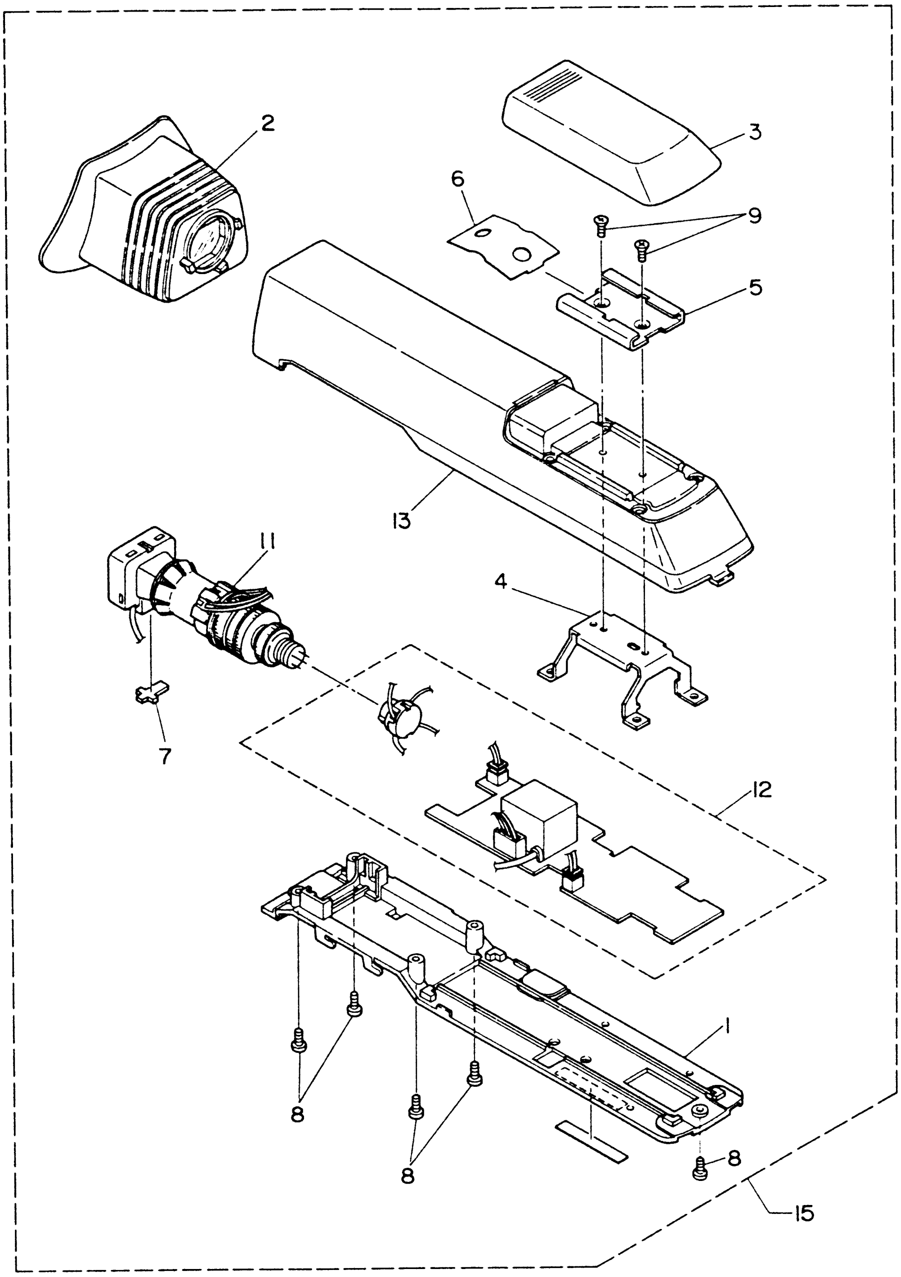
10
IMS/SSG BOARD ASSY <21>
11
9
(DC-DC CONVERTER)
12
AF BOARD ASSY <23>
13

#	⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
				OPTICAL BLOCK ASSEMBLY <M4>
		1	YQ30281	OPTICAL LPF HOLDER
		2	YU40710	OPTICAL LPF
		3	PQ42339	SPACER RUBBER
	⚠	4	TCD236C	IC (CCD)
		5	YQ30280	IMAGER HOLDER
		6	SPSK2004F	MINI SCREW, X2
		7	DPSP2008Z	SCREW, X2
		8	SPSP2004Z	SCREW, X2
	⚠	9	YU40789	DC-DC CONVERTER
	⚠	10	YU40709-1-2	OPTICAL BLOCK ASSY, INCL.11,12
		11	YQ40697	LENS BKT
		12	SDSF2006Z	TAPPING SCREW, X2
		13	SDSF2006Z	TAPPING SCREW, X2

6.6 ELECTRONIC VIEWFINDER ASSEMBLY <M5>



ELECTRICAL VIEWFINER ASSEMBLY <M5>

#	⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
		1	YU30189-001	BOTTOM CASE
		2	YU30189-002	LENS ASSY
		3	YU30189-004	SHOE COVER
		4	YU30189-005	ARM
		5	YU30189-006	RIGHT SHOE
		6	YU30189-007	PLATE SPRING
		7	YU30181-014	HIGTH VOLTAGE COVER
		8	YU30045-013	SCREW, X5
		9	YU30189-010	SCREW, X2
		11	YU30189-012	CRT ASSY
		12	YU30189-033	E.VF BOARD ASSY
		13	YU30189-042	TOP COVER
	⚠	15	YU30189D-5	E.VF ASSY, INCL.1-9,11-13

SECTION 7
PARTS LIST

SAFETY PRECAUTION
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS—All resistance values are in ohms (Ω), unless otherwise indicated.

k	1,000 (Kilo)
M	1,000,000 (Mega)
Chip R	Chip Resistor
Chip VR	Chip Variable Resistor
Comp. R	Composition Resistor
CR	Carbon Film Resistor
FR	Fusible Resistor
MFR	Metal Film Resistor
MPR	Metal Plate Resistor
OMR	Oxide Metal Film Resistor
PMR	Precision Metal Film Resistor
UFR	Unflammable Resistor
VR	Variable Resistor (Potentiometer)
WR	Wire Wound Resistor

CAPACITORS—All capacitance values are in μF, unless otherwise indicated.

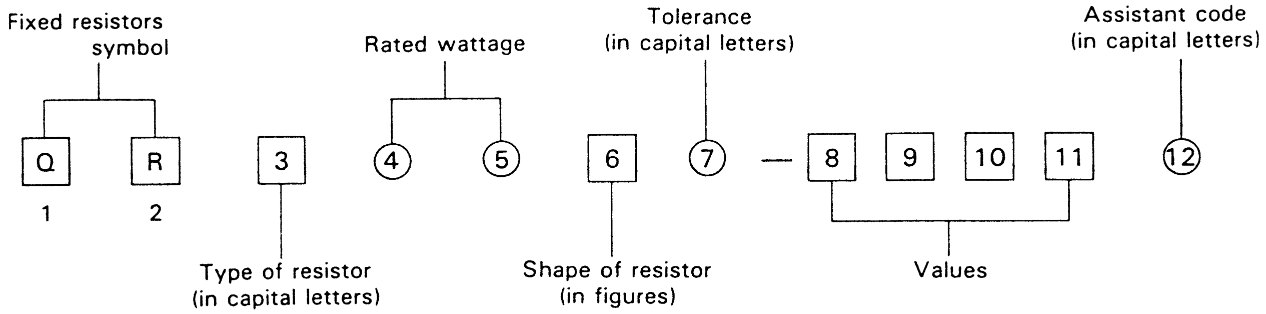
pF	$\mu\mu$F (Pico farad)
C Cap	Ceramic Capacitor
Chip Cap	Chip Capacitor
Chip T Cap	Chip Tantalum Capacitor
E Cap	Electrolytic Capacitor
FM Cap	Film Mica Capacitor
LL Cap	Low Leak Current Electrolytic Capacitor
MM Cap	Metalized Mylar Capacitor
MP Cap	Metalized Paper Capacitor
MY Cap	Mylar Capacitor
NP Cap	Non-polar Capacitor
PC Cap	Polycarbonate Capacitor
PP Cap	Polypropylene Capacitor
PS Cap	Polystyrol Capacitor
T Cap	Tantalum Capacitor
TF Cap	Thin Film Capacitor
TR Cap	Trimmer Capacitor

NOTES:
- [M] indicates mechanical symbol number.
- [2 digits] indicates circuit board symbol number.
- "X " indicates quantity per set.

7.1 STANDARD PART NUMBER CODING

7.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.


Fixed resistors symbol
Rated wattage
Tolerance (in capital letters)
Assistant code (in capital letters)
Q
R
3
④
⑤
6
⑦
—
8
9
10
11
⑫
1
2
Type of resistor (in capital letters)
Shape of resistor (in figures)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon film resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors

Rated wattage (fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance (seventh digit)

F	±1 %
G	±2 %
J	±5 %
K	±10 %
M	±20 %

Assistant code (twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead tapping
Z	Lead tapping

Values (eighth — tenth or eleventh digits)

examples:

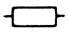
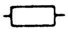
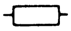
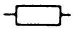
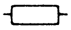
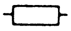
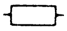
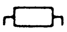
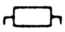
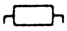
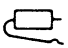
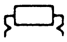
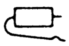
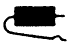
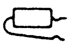
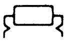
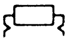
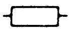
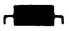
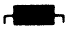
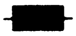
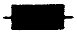
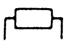
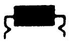
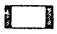
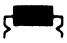
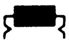
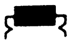
R47		0.47 Ω
4R7		4.7 Ω
470	47×10^0	47 Ω
471	47×10^1	470 Ω
472	47×10^2	4.7 kΩ
473	47×10^3	47 kΩ
474	47×10^4	470 kΩ
475	47×10^5	4.7 MΩ

QRV resistance shown by four digits:

4640	464×10^0	464 Ω
4641	464×10^1	4.64 kΩ
4642	464×10^2	46.4 kΩ

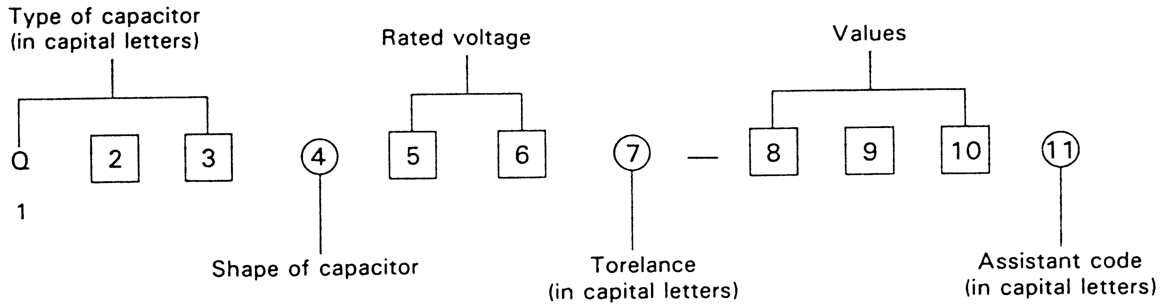
Shape of resistor (sixth digit)

Note: ■ indicates flame retardant resistor.

Shape of resistor \ Type of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

7.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.


Type of capacitor
(in capital letters)
Rated voltage
Values
Q
2
3
④
5
6
⑦
—
8
9
10
⑪
1
Shape of capacitor
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first — third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first — third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first — third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	± 20 %
F	± 1 %	N	± 30 %
G	± 2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	± 5 %	X	$^{+40}_{-20}$ %
K	± 10 %	Z	$^{+80}_{-20}$ %

Values (eighth — tenth digits)

Example : Values are in picofarads

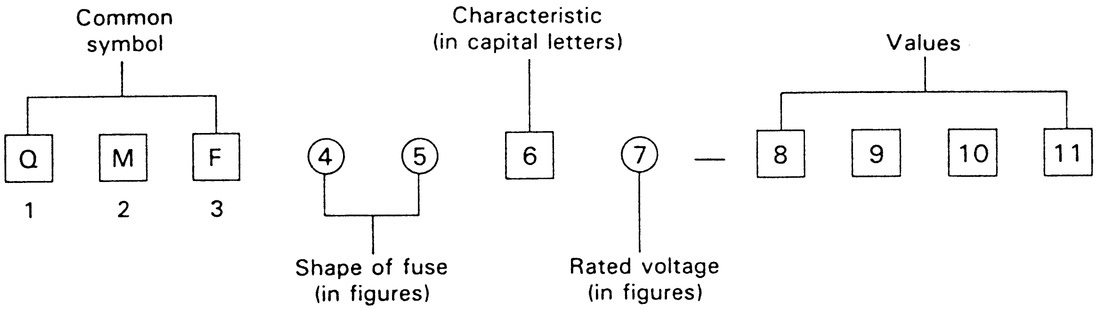
101 .... 10×10^1 pF .... 100 pF
102 .... 10×10^2 pF .... 1,000 pF (0.001 μF)
103 .... 10×10^3 pF .... 10,000 pF (0.01 μF)
104 .... 10×10^4 pF .... 100,000 pF (0.1 μF)
105 .... 10×10^5 pF .... 1 μF
5R0 .... 5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead tapping
Y	Lead tapping

7.1.3 Fuse coding

Standard fuse part numbers are as follows.


Common symbol
Characteristic (in capital letters)
Values
Q
M
F
1
2
3
④
⑤
6
⑦
—
8
9
10
11
Shape of fuse (in figures)
Rated voltage (in figures)

Shape of fuse
(fourth and fifth digits)

51	ϕ5.2×20 mm
60	ϕ6.4×30 mm
61	ϕ6.35×31.8 mm
63	ϕ6.4×30 mm with lead wires
66	ϕ6.35×31.8 mm with lead wires
00	Special type

Rated voltage
(seventh digit)

1	AC125 V
2	AC250 V
3	0.1–1 A : AC250 V 1.25–6.3 A : AC125 V

Values
(eighth-tenth or eleventh digits)
example:
R63 .... 0.63 A
1R0 .... 1.0 A
2R5 .... 2.5 A
100 .... 10 A
R315 .... 0.315 A
1R25 .... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

MAIN BOARD ASSEMBLY <01>

#	⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
		PWBA	YB10018E-02	MAIN BOARD ASSY
		IC101	BU3777K	IC
		IC102	M51799FP	IC
		IC103	M52410FP	IC
		IC104	BA10358F	IC
		OR	NJM2904E	IC
		IC105	VC5026G	IC
		IC106	BU4011BF	IC
		IC401	VC2088	IC
		IC402	M54543ASL	IC
		IC403	BU4584BF	IC
		IC404	UPD74HC04G	IC
		OR	MN74HC04S	IC
		IC405	S-81252HG	IC
		IC406	S-8054HN	IC
		IC407	TC4S81F	IC
		IC602	TC7S08F	IC
		Q103	2SC4081	TRANSISTOR
		OR	2SD1819	TRANSISTOR
		Q106	DTC144EU	TRANSISTOR
		Q107	DTA144EU	TRANSISTOR
		Q110	DTC144EU	TRANSISTOR
		Q112	DTC144EU	TRANSISTOR
		Q114	DTC144EU	TRANSISTOR
		Q120	DTC144EU	TRANSISTOR
		Q121	DTC144EU	TRANSISTOR
		Q122	DTC144EU	TRANSISTOR
		Q125	2SB798	TRANSISTOR
		Q126	2SB798	TRANSISTOR
		Q127	2SB798	TRANSISTOR
		Q131	2SC4081	TRANSISTOR
		Q132	DTC144EU	TRANSISTOR
		Q133	2SA1576	TRANSISTOR
		Q134	DTC144EU	TRANSISTOR
		Q135	DTC144EU	TRANSISTOR
		Q136	DTC144EU	TRANSISTOR
		Q137	DTC144EU	TRANSISTOR
		Q138	DTC144EU	TRANSISTOR
		Q139	FMU1	TRANSISTOR
		Q140	DTC144ES	TRANSISTOR
		Q301	2SC4081(S)	TRANSISTOR
		OR	2SC4081(R)	TRANSISTOR
		Q302	2SC4081(S)	TRANSISTOR
		OR	2SC4081(R)	TRANSISTOR
		Q303	2SC4081(S)	TRANSISTOR
		OR	2SC4081(R)	TRANSISTOR
		Q401	DTA114EU	TRANSISTOR
		Q402	DTA114EU	TRANSISTOR
		Q403	2SA1576	TRANSISTOR
		Q404	2SA1576(Q)	TRANSISTOR
		Q405	2SK665	FE TRANSISTOR
		Q406	2SK665	FE TRANSISTOR
		Q407	2SA1577	TRANSISTOR
		Q408	2SA1577	TRANSISTOR
		Q409	2SA1577	TRANSISTOR
		Q501	FMU1	TRANSISTOR
		Q603	2SK665	FE TRANSISTOR
		D11	ERA81-004	DIODE
		D102	MA141WK	DIODE
		OR	DAN202U	DIODE
		D103	MA704	DIODE
		D104	MA141WK	DIODE
		OR	DAN202U	DIODE
		D106	MA141WK	DIODE
		OR	DAN202U	DIODE
		D107	MA141WA	DIODE
		OR	DAP202U	DIODE
		D401	DA204U	DIODE
		D402	DA204U	DIODE
		D403	DAN202U	DIODE
		OR	MA141WK	DIODE
		D404	DA204U	DIODE
		D405	RD6.8EB1	ZENER DIODE
		OR	RD6.8EB2	ZENER DIODE
		D406	RD6.8EB1	ZENER DIODE
		OR	RD6.8EB2	ZENER DIODE
		R101	YU40689-1-1	V RESISTOR, TRACKING
		R102	NRSA63J-102N	RESISTOR
		R103	NVP1301-103N	V RESISTOR, TRACKING PRESET
		R104	NRSA63J-102N	RESISTOR
		R105	NRSA63J-103N	RESISTOR
		R108	NVP1301-474N	V RESISTOR, PB SW
		R109	NRSA63J-564N	RESISTOR
		R110	NRSA63J-102N	RESISTOR
		R112	NRSA63J-103N	RESISTOR
		R114	NRSA63J-102N	RESISTOR
		R116	NRSA63J-394N	RESISTOR
		R117	NRSA63J-103N	RESISTOR
		R118	NRSA63J-103N	RESISTOR
		R119	NRSA63J-471N	RESISTOR
		R120	NRSA63J-105N	RESISTOR
		R121	NRSA63J-222N	RESISTOR
		R122	NRSA63J-154N	RESISTOR
		R126	NRSA63J-562N	RESISTOR
		R127	NRSA63J-123N	RESISTOR
		R128	NRSA63J-183N	RESISTOR
		R129	NRSA63J-105N	RESISTOR
		R131	NRSA63J-184N	RESISTOR
		R132	NRSA63J-154N	RESISTOR
		R133	NRSA63J-824N	RESISTOR
		R135	NRSA63J-154N	RESISTOR
		R136	NRSA63J-184N	RESISTOR
		R137	NRSA63J-102N	RESISTOR
		R138	NRSA63J-102N	RESISTOR
		R139	NRSA63J-473N	RESISTOR
		R140	NRSA63J-473N	RESISTOR
		R152	NRSA63J-683N	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R154	NRSA63J-274N	RESISTOR
	R160	NRSA63J-561N	RESISTOR
	R161	NRVA62D-683N	RESISTOR
	R162	NRVA62D-104N	RESISTOR
	R163	QRSA08J-394YN	RESISTOR
	R168	NRSA63J-683N	RESISTOR
	R170	NRSA63J-102N	RESISTOR
	R171	NRSA63J-102N	RESISTOR
	R173	NRSA63J-102N	RESISTOR
	R174	NRSA63J-333N	RESISTOR
	R182	NRSA63J-473N	RESISTOR
	R183	NRSA63J-473N	RESISTOR
	R184	NRSA63J-333N	RESISTOR
	R185	NRSA63J-105N	RESISTOR
	R186	NRSA63J-103N	RESISTOR
	R187	NRSA63J-0R0A	RESISTOR
	R188	NRSA63J-472N	RESISTOR
	R189	NRSA63J-474N	RESISTOR
	R190	NRSA63J-103N	RESISTOR
	R202	NRSA63J-473N	RESISTOR
	R203	NRSA63J-473N	RESISTOR
	R204	NRSA63J-473N	RESISTOR
	R210	NRSA63J-683N	RESISTOR
	R211	NRSA63J-183N	RESISTOR
	R212	NRSA63J-103N	RESISTOR
	R213	NRSA63J-103N	RESISTOR
	R214	NRSA63J-103N	RESISTOR
	R219	NRSA63J-560N	RESISTOR
	R220	NRSA63J-560N	RESISTOR
	R224	NRSA63J-331N	RESISTOR
	R226	NRSA63J-102N	RESISTOR
	R227	NRSA63J-102N	RESISTOR
	R234	NRSA63J-0R0A	RESISTOR
	R235	NRSA63J-273N	RESISTOR
	R236	NRSA63J-103N	RESISTOR
	R237	NPSA63J-103N	RESISTOR
	R238	NRSA63J-103N	RESISTOR
	R241	NRSA63J-273N	RESISTOR
	R242	NRSA63J-102N	RESISTOR
	R301	NRSA63J-393N	RESISTOR
	R302	NRSA63J-393N	RESISTOR
	R303	NRSA63K-5R6N	RESISTOR
	R304	NRSA63K-5R6N	RESISTOR
	R305	NRSA63J-153N	RESISTOR
	R306	NRSA63J-102N	RESISTOR
	R401	NRSA63J-182N	RESISTOR
	R402	NRSA63J-103N	RESISTOR
	R403	NRSA63J-182N	RESISTOR
	R404	NRSA63J-103N	RESISTOR
	R405	NRSA63J-222N	RESISTOR
	R406	NRVA62D-753N	RESISTOR
	R407	QRSA08J-302YN	RESISTOR
	R408	NRVA62D-683N	RESISTOR
	R409	NRSA63J-102N	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R410	NRSA63J-473N	RESISTOR
	R411	NRSA63J-473N	RESISTOR
	R412	NRSA63J-222N	RESISTOR
	R413	NRSA63J-222N	RESISTOR
	R414	NRSA63J-104N	RESISTOR
	R415	NRSA63J-222N	RESISTOR
	R416	NRSA63J-105N	RESISTOR
	R417	NRSA63J-333N	RESISTOR
	R418	NRSA63J-470N	RESISTOR
	R419	NRSA63J-222N	RESISTOR
	R420	NRSA63J-222N	RESISTOR
	R421	NRSA63J-223N	RESISTOR
	R422	NRSA63J-472N	RESISTOR
	R424	NRSA63J-223N	RESISTOR
	R426	NRSA63J-223N	RESISTOR
	R427	NRSA63J-472N	RESISTOR
	R429	NRSA63J-223N	RESISTOR
	R430	NRSA63J-103N	RESISTOR
	R432	NRSA63J-223N	RESISTOR
	R433	NRSA63J-223N	RESISTOR
	R434	NRSA63J-472N	RESISTOR
	R435	NRSA63J-103N	RESISTOR
	R436	NRSA63J-223N	RESISTOR
	R437	NRSA63J-103N	RESISTOR
	R438	NRSA63J-103N	RESISTOR
	R439	NRSA63J-223N	RESISTOR
	R441	NRSA63J-151N	RESISTOR
	R443	NRSA63J-751N	RESISTOR
	R444	NRSA63J-223N	RESISTOR
	R445	NRSA63J-223N	RESISTOR
	R446	NRSA63J-223N	RESISTOR
	R447	NRSA63J-223N	RESISTOR
	R448	NRSA63J-222N	RESISTOR
	R449	NRSA63J-222N	RESISTOR
	R451	NRSA63J-103N	RESISTOR
	R452	NRSA63J-203N	RESISTOR
	R453	NRSA63J-103N	RESISTOR
	R455	NRSA63J-103N	RESISTOR
	R456	NRSA63J-203N	RESISTOR
	R459	NRSA63J-103N	RESISTOR
	R460	NRSA63J-103N	RESISTOR
	R461	NRSA63J-222N	RESISTOR
	R462	NRSA63J-203N	RESISTOR
	R463	NRSA63J-222N	RESISTOR
	R464	NRSA63J-103N	RESISTOR
	R465	NRSA63J-203N	RESISTOR
	R466	NRSA63J-222N	RESISTOR
	R467	NRSA63J-103N	RESISTOR
	R468	NRSA63J-203N	RESISTOR
	R469	NRSA63J-103N	RESISTOR
	R470	NRSA63J-203N	RESISTOR
	R471	NRSA63J-104N	RESISTOR
	R472	NRSA63J-823N	RESISTOR
	R473	NRSA63J-223N	RESISTOR
	R474	NRSA63J-222N	RESISTOR
	R475	NRSA63J-203N	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R476	NRSA63J-222N	RESISTOR
	R477	NRSA63J-103N	RESISTOR
	R478	NRSA63J-203N	RESISTOR
	R479	QRD162J-683	RESISTOR
	R480	NRSA63J-563N	RESISTOR
	R481	NRSA63J-472N	RESISTOR
	R482	NRSA63J-203N	RESISTOR
	R483	NRSA63J-103N	RESISTOR
	R484	NRSA63J-203N	RESISTOR
	R485	NRSA63J-103N	RESISTOR
	R486	NRSA63J-103N	RESISTOR
	R487	NRSA63J-103N	RESISTOR
	R488	NRSA63J-102N	RESISTOR
	R489	NRSA63J-103N	RESISTOR
	R490	NRSA63J-103N	RESISTOR
	R491	NRSA63J-222N	RESISTOR
	R492	NRSA63J-103N	RESISTOR
	R493	NRSA63J-273N	RESISTOR
	R494	NRSA63J-222N	RESISTOR
	R495	NRSA63J-473N	RESISTOR
	R496	NRSA63J-103N	RESISTOR
	R497	NRSA63J-155N	RESISTOR
	R498	NRSA63J-470N	RESISTOR
	R501	NVP1301-103N	V RESISTOR,REC COLOR LEVEL
	R502	NRSA63J-0R0A	RESISTOR
	R614	QRD161J-102	RESISTOR
	RA101	YU40172-102NY	NETWORK RESISTOR
	RA102	YU40172-104NY	NETWORK RESISTOR
	RA103	YU40172-332NY	NETWORK RESISTOR
	C11	QERF1CM-106	E CAPACITOR
	C12	QEDF1CM-476	E CAPACITOR
	C13	QEDF1AM-826	E CAPACITOR
	C14	QEDF1AM-826	E CAPACITOR
	C101	QFZ0095-683Z	M CAPACITOR
	C103	QCYA1HK-392	CAPACITOR
	C104	NCT06CH-270A	CAPACITOR
	C105	NCT06CH-270A	CAPACITOR
	C106	QEF81AM-106	TANTAL CAPACITOR
	C107	QCYA1HK-103	CAPACITOR
	C108	QCYA1HK-562	CAPACITOR
	C109	QCYA1HK-103	CAPACITOR
	C110	QCSA1HJ-102	CAPACITOR
	C111	QEPA1CM-106ZE	E CAPACITOR
	C112	QEPA1CM-106ZE	E CAPACITOR
	C115	NCF31CZ-104A	CAPACITOR
	C116	NCB31EK-103A	CAPACITOR
	C121	QCYA1HK-222	CAPACITOR
	C122	QFZ0096-224Z	MM CAPACITOR
	C123	QCYA1HK-332	CAPACITOR
	C124	QCYA1EK-223	CAPACITOR
	C125	QCYA1EK-223	CAPACITOR
	C126	QCYA1EK-223	CAPACITOR
	C127	QCYA1EK-223	CAPACITOR
	C128	QCYA1HK-222	CAPACITOR
	C129	QFZ0095-104Z	MM CAPACITOR
	C130	QERF1CM-106	E CAPACITOR
	C141	NCB31HK-102A	CAPACITOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C142	NCF31CZ-104A	CAPACITOR
	C143	NCT06CH-100A	CAPACITOR
	C144	NCF31CZ-104A	CAPACITOR
	C145	NCB31HK-471A	CAPACITOR
	C146	NCS31HJ-101A	CAPACITOR
	C147	NCB31HK-102A	CAPACITOR
	C148	QCFA1EZ-104	CAPACITOR
	C149	QCYA1HK-562	CAPACITOR
	C150	PU59758-105	CAPACITOR
	C151	PU59758-105	CAPACITOR
	C161	NCB31EK-103A	CAPACITOR
	C162	NCB31EK-103A	CAPACITOR
	C163	QCYA1EK-223	CAPACITOR
	C164	QCYA1EK-223	CAPACITOR
	C165	QCYA1EK-223	CAPACITOR
	C166	QERF1AM-336	E CAPACITOR
	C167	QERF1AM-336	E CAPACITOR
	C168	QERF1AM-336	E CAPACITOR
	C169	QERF1CM-106	E CAPACITOR
	C170	NCB31HK-102A	CAPACITOR
	C301	QERF1HM-104	E CAPACITOR
	C302	NCS31HJ-271A	CAPACITOR
	C303	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C304	NCS31HJ-181A	CAPACITOR
	C305	NCS31HJ-181A	CAPACITOR
	C306	NCS31HJ-101A	CAPACITOR
	C401	QERF1CM-476	E CAPACITOR
	C402	QERF1AM-476	E CAPACITOR
	C403	QCFA1EZ-104	CAPACITOR
	C404	PU59758-105	CAPACITOR
	C405	QCFA1EZ-104	CAPACITOR
	C406	NCS31HJ-330A	CAPACITOR
	C407	NCS31HJ-330A	CAPACITOR
	C408	QCFA1EZ-104	CAPACITOR
	C409	NCB31EK-103A	CAPACITOR
	C410	NCB31EK-103A	CAPACITOR
	C411	NCB31EK-103A	CAPACITOR
	C412	QCFA1EZ-104	CAPACITOR
	C413	QEF81AM-106	TANTAL CAPACITOR
	C414	PU58948-104	CAPACITOR
	C415	PU58948-104	CAPACITOR
	C501	QCYA1HK-103	CAPACITOR
	C502	QCYA1HK-103	CAPACITOR
	C601	QCFA1EZ-104A	CAPACITOR
	L11	PU56181-470	CHOKE COIL
	L301	PU56175	S.TRANS
	L302	PU59152-470J	PEAKING COIL
	L303	PU59152-1R2K	PEAKING COIL
⚠	CF401	PU55812	RESONATOR
⚠	X101	YU40404	CRYSTAL RESONATOR
⚠	OR	YU40405	CRYSTAL RESONATOR
	SW1	PU59836	LEAF SWITCH
	DD1	YU40675	DC-DC CONVERTER
	OR	YU40676	DC-DC CONVERTER

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PS401	PU59834	PHOTO SENSOR
	PS402	PU59834	PHOTO SENSOR
	PS404	TLN104	LE DIODE
⚠	HD1	YU40170	FUSE CLIP, X2
	J1	YU40690	DC JACK
	SCW1	SPSG2004M	SCREW,X3(TACT SW, LEAF SW)
	SLD1	YU40918	SHEET
	SPC1	YU40815	BOARD SPACER
	SPC2	YQM30029-16	SPACER
	FT101	YU40674	FILTER
	TP101	YU40581-AY	CHIP TP(2125)
	TP102	YU40581-AY	CHIP TP(2125)
	TP103	YU40581-AY	CHIP TP(2125)
	TP104	YU40581-AY	CHIP TP(2125)
	TP105	YU40581-AY	CHIP TP(2125)
	TP106	YU40581-AY	CHIP TP(2125)
	TP107	YU40581-AY	CHIP TP(2125)
	TP108	YU40581-AY	CHIP TP(2125)
	TP109	YU40581-AY	CHIP TP(2125)
	TP110	YU40581-AY	CHIP TP(2125)
	TP111	YU40581-AY	CHIP TP(2125)
	TP112	YU40581-AY	CHIP TP(2125)
	TP301	YU40581-AY	CHIP TP(2125)
	CN11	YU40096-3	CONNECTOR
	CN21	YU40096-4	CONNECTOR
	CN22	YU40683-14	CONNECTOR
	CN23	YU40108-15	CONNECTOR
	CN31	YU40683-22	CONNECTOR
	CN32	YU40677-30	CONNECTOR
	CN41	YU40937-6	CONNECTOR
	CN42	YU40096-3	CONNECTOR
	CN43	YU40096-3	CONNECTOR
	CN51	YU40684-30	CONNECTOR
	CN61	YU40666-12	CONNECTOR
	CN62	YU40666-12	CONNECTOR
	CN71	YU40095-3	CONNECTOR
⚠	CP11	ICP-F10	CIRCUIT PROTECTOR
⚠	CP12	ICP-F20	CIRCUIT PROTECTOR
⚠	CP13	ICP-F20	CIRCUIT PROTECTOR
⚠	CP14	ICP-F20	CIRCUIT PROTECTOR
⚠	F1	QMF51E2-3R15	FUSE,NOT INCL.MAIN BOARD ASSY

—A.D.BOARD ASSEMBLY—

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB30039A-01-C	A.D.BOARD ASSY
	IC602	UPD4538BG	IC
	OR	MN4538BS	IC
	Q604	DTC114EK	TRANSISTOR
	D601	RB451F	DIODE
	R610	QRSA08J-224YN	RESISTOR
	R611	QRSA08J-563YN	RESISTOR
	R612	QRSA08J-0R0Y	RESISTOR
	C602	NCR21CM-473A	CAPACITOR
	C603	CYA1HK-103	CAPACITOR
	C604	YU40973	TANTAL CAPACITOR

—LC BOARD ASSEMBLY—

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB30045A	LC BOARD ASSY
	R1	QRSA08J-0R0Y	RESISTOR
	R604	YU41015	NISE FILTER
	C1	QEF81AM-106	TANTAL CAPACITOR
	C2	QEF81AM-106	TANTAL CAPACITOR
	L2	YU40740-330KY	COIL

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A/V BOARD ASSEMBLY <02>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB10036A-C	A/V BOARD ASSY
	IC101	BA7288K	IC
	IC102	BA7131F	IC
	IC103	LA7316M	IC
	IC104	NJM2233AM	IC
⚠	IC105	H8D7046	IC
	IC106	MSM6965-3MS	IC
	IC301	BA7751AF	IC
	IC302	M5218FP	IC
	IC303	M5218FP	IC
	Q101	2SA1576	TRANSISTOR
	Q102	DTC144EU	TRANSISTOR
	Q103	2SC4081(RS)	TRANSISTOR
	Q104	2SA1576	TRANSISTOR
	Q105	DTC114EU	TRANSISTOR
	Q106	FMC3	TRANSISTOR
	Q107	2SC4081(RS)	TRANSISTOR
	Q108	2SA1576	TRANSISTOR
	Q109	2SC4081(RS)	TRANSISTOR
	Q110	2SC4081(RS)	TRANSISTOR
	Q112	FMQ1	TRANSISTOR
	Q113	2SC4081(RS)	TRANSISTOR
	Q114	DTC144EU	TRANSISTOR
	Q115	DTC144EU	TRANSISTOR
	Q118	2SC4081(RS)	TRANSISTOR
	Q119	2SB624-T1BBV4	TRANSISTOR
	Q120	DTA144EU	TRANSISTOR
	Q122	2SA1576	TRANSISTOR
	Q123	2SA1576	TRANSISTOR
	Q301	FMW3	TRANSISTOR
	Q302	DTA143EU	TRANSISTOR
	Q303	2SC4081(RS)	TRANSISTOR

#	⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
		Q304	2SC4081(RS)	TRANSISTOR
		Q305	DTA143EU	TRANSISTOR
		Q306	DTA143EU	TRANSISTOR
		Q307	DTC144EU	TRANSISTOR
		Q308	2SD596	TRANSISTOR
		Q309	2SC4081(RS)	TRANSISTOR
		D101	DAN202U	DIODE
		D102	DA204U	DIODE
		D103	DAN202U	DIODE
		D105	DAN202U	DIODE
		D107	DAN202U	DIODE
		D109	DAN202U	DIODE
		D110	1SS133	DIODE
		R101	QRD161J-750	RESISTOR
		R102	NRSA63J-333N	RESISTOR
		R103	NRSA63J-104N	RESISTOR
		R104	NRSA63J-102N	RESISTOR
		R105	NRSA63J-102N	RESISTOR
		R106	NRSA63J-222N	RESISTOR
		R107	NRSA63J-103N	RESISTOR
		R108	NRSA63J-563N	RESISTOR
		R109	NRSA63J-391N	RESISTOR
		R110	NRSA63J-152N	RESISTOR
		R111	NRSA63J-103N	RESISTOR
		R112	NVP1301-103N	V RESISTOR,DEVIATION
		R113	NVP1301-223N	V RESISTOR,CARRIER
		R114	NVP1301-104N	V RESISTOR,WHITE CLIP LEVEL
		R115	NRSA63J-273N	RESISTOR
		R116	NRSA63J-333N	RESISTOR
		R117	NVP1301-683N	V RESISTOR,DARK CLIP LEVEL
		R118	NVP1301-102N	V RESISTOR,REC FM LEVEL
		R119	NRSA63J-153N	RESISTOR
		R121	NRSA63J-103N	RESISTOR
		R122	NRSA63J-102N	RESISTOR
		R123	NRSA63J-222N	RESISTOR
		R124	NRSA63J-203N	RESISTOR
		R125	NRSA63J-203N	RESISTOR
		R126	NRSA63J-471N	RESISTOR
		R128	NRSA63J-102N	RESISTOR
		R129	NRSA63J-272N	RESISTOR
		R130	NRSA63J-153N	RESISTOR
		R131	NRSA63J-333N	RESISTOR
		R132	NRSA63J-102N	RESISTOR
		R133	NVP1301-473N	V RESISTOR,PB Y LEVEL
		R134	NRSA63J-472N	RESISTOR
		R135	NRSA63J-102N	RESISTOR
		R136	NRSA63J-271N	RESISTOR
		R137	NRSA63J-102N	RESISTOR
		R138	NRSA63J-152N	RESISTOR
		R139	NRSA63J-222N	RESISTOR
		R140	NRSA63J-102N	RESISTOR
		R141	NRSA63J-222N	RESISTOR
		R142	NRSA63J-391N	RESISTOR
		R143	NRSA63J-391N	RESISTOR
		R144	NRSA63J-561N	RESISTOR
		R145	NRSA63J-562N	RESISTOR
		R146	NVP1301-222N	V RESISTOR,PB RF EQ
		R147	NRSA63J-331N	RESISTOR
		R148	NRSA63J-122N	RESISTOR
		R149	NRSA63J-561N	RESISTOR
		R150	NRSA63J-181N	RESISTOR
		R152	NRSA63J-821N	RESISTOR
		R153	NRSA63J-182N	RESISTOR
		R155	NRSA63J-102N	RESISTOR
		R156	NRSA63J-0R0A	RESISTOR
		R157	NRSA63J-824N	RESISTOR
		R158	NRSA63J-102N	RESISTOR
		R159	NRSA63J-122N	RESISTOR
		R160	NRSA63J-333N	RESISTOR
		R161	NRSA63J-333N	RESISTOR
		R162	NRSA63J-391N	RESISTOR
		R163	NRSA63J-152N	RESISTOR
		R165	NVP1301-102N	V RESISTOR,EE BURST LEVEL
		R166	NVP1301-102N	V RESISTOR,PB BURST LEVEL
		R167	NRSA63J-0R0A	RESISTOR
		R168	NRSA63J-104N	RESISTOR
		R171	NRSA63J-223N	RESISTOR
		R172	NRSA63J-122N	RESISTOR
		R174	NRSA63J-102N	RESISTOR
		R176	NRSA63J-0R0A	RESISTOR
		R177	NRSA63J-122N	RESISTOR
		R178	NRSA63J-0R0A	RESISTOR
		R180	NRSA63J-151N	RESISTOR
		R182	NRSA63J-152N	RESISTOR
		R184	NRSA63J-102N	RESISTOR
		R185	NRSA63J-511N	RESISTOR
		R186	NRSA63J-511N	RESISTOR
		R187	NRSA63J-331N	RESISTOR
		R188	NRSA63J-392N	RESISTOR
		R189	NRSA63J-122N	RESISTOR
		R190	NRSA63J-102N	RESISTOR
		R191	NRSA63J-223N	RESISTOR
		R192	NRSA63J-681N	RESISTOR
		R193	NRSA63J-331N	RESISTOR
		R194	NRSA63J-331	RESISTOR
		R195	NRSA63J-681	RESISTOR
		R196	NRSA63J-332N	RESISTOR
		R197	NRSA63J-152N	RESISTOR
		R199	NVP1301-102N	V RESISTOR,PB 1H DL Y LEVEL
		R200	NVP1301-681N	V RESISTOR,EE Y LEVEL
		R201	NRSA63J-102N	RESISTOR
		R202	NRSA63J-471N	RESISTOR
		R203	NRSA63J-332N	RESISTOR
		R204	NRSA63J-332N	RESISTOR
		R205	NRSA63J-152N	RESISTOR
		R206	NRSA63J-0R0A	RESISTOR
		R207	NRSA63J-103N	RESISTOR
		R208	NRSA63J-332N	RESISTOR
		R301	NRSA63J-100N	RESISTOR
		R302	NRSA63J-682N	RESISTOR
		R303	NRSA63J-822N	RESISTOR
		R304	NRSA63J-334N	RESISTOR
		R305	NRSA63J-331N	RESISTOR
		R306	NRSA63J-470N	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R307	NRSA63J-823N	RESISTOR
	R308	NRSA63J-152N	RESISTOR
	R309	NRSA63J-183N	RESISTOR
	R310	NRSA63J-123N	RESISTOR
	R311	NRSA63J-272N	RESISTOR
	R312	NRSA63J-103N	RESISTOR
	R313	NVP1301-103N	V RESISTOR,AUDIO REC LEVEL
	R315	NRSA63J-182N	RESISTOR
	R316	NRSA63J-272N	RESISTOR
	R317	NRSA63J-103N	RESISTOR
	R318	NRSA63J-185N	RESISTOR
	R319	NRSA63J-822N	RESISTOR
	R320	NRSA63J-223N	RESISTOR
	R321	NRSA63J-0R0A	RESISTOR
	R323	NRSA63J-472N	RESISTOR
	R324	NRSA63J-123N	RESISTOR
	R325	NRSA63J-103N	RESISTOR
	R326	NRSA63J-222N	RESISTOR
	R327	NRSA63J-393N	RESISTOR
	R328	NRSA63J-271N	RESISTOR
	R329	NVP1301-473N	V RESISTOR,AUDIO BIAS LEVEL
	R330	NRSA63J-473N	RESISTOR
	R331	NRSA63J-473N	RESISTOR
	R332	NRSA63K-2R2N	RESISTOR
	R333	NRSA63K-2R2N	RESISTOR
	R334	NRSA63J-102N	RESISTOR
	R335	NRSA63J-563N	RESISTOR
	R346	NRSA63J-473N	RESISTOR
	R347	NRSA63J-563N	RESISTOR
	R348	NRSA63J-221N	RESISTOR
	R349	NRSA63J-103N	RESISTOR
	R350	NRSA63J-104N	RESISTOR
	R351	NRSA63J-104N	RESISTOR
	R352	NRSA63J-104N	RESISTOR
	R353	NRSA63J-101N	RESISTOR
	R354	NRSA63J-101N	RESISTOR
	R355	NRSA63J-104N	RESISTOR
	R357	NRSA63J-271N	RESISTOR
	R358	NRSA63J-0R0A	RESISTOR
	R360	NRSA63J-151N	RESISTOR
	C101	QEKC0HM-477	E CAPACITOR
	C102	QCYA1EK-103	CAPACITOR
	C103	QERF1CM-476	E CAPACITOR
	C104	QEF81CM-105	TANTAL CAPACITOR
	C105	QERF1HM-105	E CAPACITOR
	C106	NCS31HJ-270A	CAPACITOR
	C108	QERF1HM-105	E CAPACITOR
	C109	NCS31HJ-390A	CAPACITOR
	C110	NCS31HJ-101A	CAPACITOR
	C111	NCB31EK-103A	CAPACITOR
	C112	NCB31EK-103A	CAPACITOR
	C113	QERF1CM-106	E CAPACITOR
	C114	QCSA1HJ-331	CAPACITOR
	C116	QERF1CM-106	E CAPACITOR
	C117	NCS31HJ-470A	CAPACITOR
	C118	QERF1CM-106	E CAPACITOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C119	NCS31HJ-330A	CAPACITOR
	C120	NCS31HJ-470A	CAPACITOR
	C121	NCB31EK-103A	CAPACITOR
	C122	NCB31EK-103A	CAPACITOR
	C125	QERF1CM-476	E CAPACITOR
	C126	NCB31EK-103A	CAPACITOR
	C127	QEE81CM-336	T.CAP
	C129	QEF80JM-475	TANTAL CAPACITOR
	C130	QEF81VM-334	TANTAL CAPACITOR
	C131	NCB31EK-103A	CAPACITOR
	C132	NCB31EK-103A	CAPACITOR
	C133	QERF1CM-476	E CAPACITOR
	C134	QCYA1EK-103	CAPACITOR
	C135	NCS31HJ-101A	CAPACITOR
	C136	NCS31HJ-101A	CAPACITOR
	C137	NCS31HJ-150A	CAPACITOR
	C139	NCB31EK-103A	CAPACITOR
	C140	NCS31HJ-121A	CAPACITOR
	C141	NCS31HJ-181A	CAPACITOR
	C142	NCS31HJ-390A	CAPACITOR
	C143	NCS31HJ-220A	CAPACITOR
	C144	NCS31HJ-220A	CAPACITOR
	C145	QCYA1EK-223	CAPACITOR
	C146	QCYA1HK-332	CAPACITOR
	C147	NCB31EK-103A	CAPACITOR
	C148	QERF1EM-335	E CAPACITOR
	C149	QERF1CM-475	E CAPACITOR
	C150	QEF81VM-224	TANTAL CAPACITOR
	C151	QERF1CM-476	E CAPACITOR
	C152	QERF1EM-335	E CAPACITOR
	C153	NCB31EK-103A	CAPACITOR
	C154	NCB31EK-103A	CAPACITOR
	C155	NCB31EK-103A	CAPACITOR
	C156	NCS31HJ-150A	CAPACITOR
	C157	QCYA1EK-223	CAPACITOR
	C158	QEE81CM-336	E CAPACITOR
	C159	NCS31HJ-221A	CAPACITOR
	C160	NCS31HJ-101A	CAPACITOR
	C161	NCB31EK-103A	CAPACITOR
	C162	NCB31EK-103A	CAPACITOR
	C163	QCYA1HK-333	CAPACITOR
	C164	QCYA1HK-333	CAPACITOR
	C166	NCR21CK-473A	CAPACITOR
	C167	QCYA1EK-223	CAPACITOR
	C168	QERF1HM-105	E CAPACITOR
	C169	QERF1HM-105	E CAPACITOR
	C170	NCS31HJ-101A	CAPACITOR
	C171	NCB31EK-103A	CAPACITOR
	C172	QERF1HM-105	E CAPACITOR
	C173	QCYA1EK-223	CAPACITOR
	C174	NCB31EK-103A	CAPACITOR
	C176	NCB31EK-103A	CAPACITOR
	C177	NCB31EK-103A	CAPACITOR
	C178	QERF1CM-476	E CAPACITOR
	C179	NCB31EK-103A	CAPACITOR
	C180	NCB31HK-272A	CAPACITOR
	C181	NCB31EK-103A	CAPACITOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C182	NCB31EK-103A	CAPACITOR
	C183	NCB31EK-103A	CAPACITOR
	C185	QCSA1HJ-331	CAPACITOR
	C186	QCYA1HK-103	CAPACITOR
	C201	PU58948-104A	CAPACITOR
	C301	QERF0JM-336	E CAPACITOR
	C302	QERF1CM-106	E CAPACITOR
	C303	NCB31HK-681A	CAPACITOR
	C304	QFJ41HJ-103	M CAPACITOR
	C305	NCB31HK-272A	CAPACITOR
	C306	QERF1HM-105	E CAPACITOR
	C307	QERF0JM-226	E CAPACITOR
	C308	QCF81CZ-105	CAPACITOR
	C309	QERF0JM-476	E CAPACITOR
	C310	QERF1CM-106	E CAPACITOR
	C311	QENF1HM-105ZE	NP E CAPACITOR
	C312	NCB31HK-821A	CAPACITOR
	C313	QERF0JM-107	E CAPACITOR
	C314	QCF81CZ-105	CAPACITOR
	C316	QCF81CZ-105	CAPACITOR
	C317	QERF0JM-226	E CAPACITOR
	C318	QERF0JM-336	E CAPACITOR
	C319	QEPA0JM-226	NP E CAPACITOR
	C320	QERF1CM-106	E CAPACITOR
	C321	QERF1HM-105	E CAPACITOR
	C322	QERF1CM-106	E CAPACITOR
	C323	QERF1CM-106	E CAPACITOR
	C324	NCB31HK-102A	CAPACITOR
	C325	NCB31HK-332A	CAPACITOR
	C326	NCB31HK-332A	CAPACITOR
	C327	NCB31HK-392A	CAPACITOR
	C328	QFZ9011-333	MM CAPACITOR
	C329	QERF1AM-336	E CAPACITOR
	C330	QERF0JM-226	E CAPACITOR
	C332	QERF1CM-106	E CAPACITOR
	C336	NCS31HJ-331A	CAPACITOR
	C337	QCF81CZ-105	CAPACITOR
	C338	NCS31HJ-121A	CAPACITOR
	C339	NCS31HJ-150A	CAPACITOR
	C340	NCS31HJ-560A	CAPACITOR
	C341	QERF1CM-106	E CAPACITOR
	C343	NCB31EK-103A	CAPACITOR
	C347	NCB31HK-562A	CAPACITOR
	C351	NCB31HK-561A	CAPACITOR
	C352	NCB31EK-103A	CAPACITOR
	C353	QER40JM-476	E CAPACITOR
	L101	YU40249-470JY	COIL
	L103	PU58201-560J	COIL
	L104	PU58201-560J	COIL
	L105	PU58201-100J	COIL
	L106	YU40248-470KY	COIL
	L108	YU40248-470KY	COIL
	L109	YU40249-470JY	COIL
	L110	YU40249-560JY	COIL
	L111	YU40249-390JY	COIL

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	L112	YU40249-331JY	COIL
	L113	YU40249-220JY	COIL
	L114	YU40249-220JY	COIL
	L115	PU59152-470J	PEAKING COIL
	L116	YU40248-470KY	PEAKING COIL
	L117	YU40249-180JY	PEAKING COIL
	L118	PU58201-150J	COIL
	L119	YU40248-470KY	COIL
	L120	PU58201-1R0K	PEAKING COIL
	OR	YU40249-1R0KY	COIL
	OR	PU59152-1R0K	COIL
	L121	YU40589-102KY	PEAKING COIL
	L122	YU40249-331JY	COIL
	L123	PU59152-330J	COIL
	L301	YU40695	EQUALIZER
	L302	YU40589-470KY	PEAKING COIL
	L303	YU40892-2-P	CHIP TRAP
	L304	YU40696	OSC TRANSFORMER
	L305	YU40248-470KY	COIL
	EQ101	PU59480-3	EQUALIZER
	EQ102	YU40976	EQUALIZER
	EQ103	YU40977	EQUALIZER
	EQ104	PU59857-Z	EQUALIZER
	EQ105	PU59031	EQUALIZER
	LPF101	PU59474-3	LOW PASS FILTER
	LPF102	YU40737-Z	LOW PASS FILTER
	LPF103	PU59476-2	LOW PASS FILTER
	BPF101	PU59477	BAND PASS FILTER
	OR	YU40503-P	4.3M BPFCU
	BPF102	YU40887-P	BAND PASS FILTER
	DL101	YU41026	COMB FILTER
⚠	X101	YU40814	CRYSTAL RESONATOR
	JP1	YU40691	A/V CONNECTER
	SLD1	YQ40923	SHIE
	SLD2	YQ40944	SHIELD PLATE
	TP101	YU40581-AY	CHIP TP(2125)
	TP102	YU40581-AY	CHIP TP(2125)
	TP103	YU40581-AY	CHIP TP(2125)
	TP104	YU40581-AY	CHIP TP(2125)
	TP105	YU40581-AY	CHIP TP(2125)
	TP106	YU40581-AY	CHIP TP(2125)
	TP108	YU40581-AY	CHIP TP(2125)
	TP110	PU56278	TEST PIN
	TP301	YU40581-AY	CHIP TP(2125)
	TP302	YU40581-AY	CHIP TP(2125)
	TP303	YU40581-AY	CHIP TP(2125)
	CN1	YU40096-5	CONNECTOR
	CN2	YU40678-30	CONNECTOR

—SSC BOARD ASSEMBLY—

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20140C-C	SSC BOARD ASSY
	Q1	DTA144EU	TRANSISTOR
	Q2	2SC4081(RS)	TRANSISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R1	NRSA63J-103N	RESISTOR
	R2	NRSA63J-224N	RESISTOR
	R3	NRSA63J-103N	RESISTOR
	C1	QEF80JM-475	TANTAL CAPACITOR

—A/V SUB BOARD ASSEMBLY—

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20148B-C	A/V SUB BOARD ASSEMBLY
	R361	NRSA63J-102N	RESISTOR
	R362	NRSA63J-102N	RESISTOR
	C196	QCFA1EZ-104	CAPACITOR
	C197	QCFA1EZ-104	CAPACITOR
	C198	QCFA1EZ-104	CAPACITOR
	C199	QCYA1HK-102	CAPACITOR

—AM BOARD ASSEMBLY—

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20159A-C	AM BOARD ASSEMBLY
	R363	NRSA63J-562N	RESISTOR
	R364	NRSA63J-103N	RESISTOR
	R365	NRSA63J-103	RESISTOR
	C353	QER40JM-476	E CAPACITOR

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PRE/REC AMP BOARD ASSEMBLY <03>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	BW7643	PRE/REC H. IC, PRE/REC MODULE

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DRUM MDA BOARD ASSEMBLY <04>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20092A-01	DRUM MDA BOARD ASSY
	IC251	BA6452F	IC
	D251	MA141WA	DIODE
	R251	QRSA08J-102YN	RESISTOR
	R252	QRSA08J-104YN	RESISTOR
	R253	QRSA08J-153YN	RESISTOR
	R254	QRSA08J-222YN	RESISTOR
	R255	QRSA08J-101YN	RESISTOR
	R256	QRSA08K-2R2YN	RESISTOR
	R257	QRSA08K-2R2YN	RESISTOR
	R258	QRSA08K-2R2YN	RESISTOR
	R259	QRG125J-R68AR	OMF RESISTOR
	R260	QRSA08J-104YN	RESISTOR
	R261	QRSA08J-0R0Y	RESISTOR
	R262	QRSA08J-0R0Y	RESISTOR
	C251	QCY81EK-104	CAPACITOR
	C252	QCYA1HK-471	CAPACITOR
	C253	QCY81CK-224	CAPACITOR
	C254	QCY81EK-104	CAPACITOR
	C255	QERF1CM-106	E CAPACITOR
	C256	QCYA1EK-223	CAPACITOR
	C257	QERF1CM-106	E CAPACITOR
	C258	QERF1CM-106	E CAPACITOR
	C259	QERF1CM-106	E CAPACITOR
	C260	QCY81EK-104	CAPACITOR
	C261	QERF1CM-106	E CAPACITOR
	SW1	YU40177	CAS.LOCK SW
	CN251	YU40682-14	CONNECTOR
	CN252	YU40108-15	CONNECTOR
	CN253	YU40096-2	CONNECTOR

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TRIGGER SW BOARD ASSEMBLY <05>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20095A	TRIGGER SW BOARD ASSY
	SW1	PU59843	TACT SWITCH
	SW2	YU40807	SLIDE SWITCH
	CN1	PU58655-3	CAP HOUSING

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IMS/SSG BOARD ASSEMBLY <21>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20088E-02-C	IMS/SSG BOARD ASSY
	IC2	TC9224F	IC
	IC3	TC6018AF	IC
	IC4	IR3P67A	IC
	IC5	UPC324G2	IC
	OR	AN1324	IC
	Q1	2SC3936(BC)	TRANSISTOR
	Q2	2SC3936(BC)	TRANSISTOR
	Q3	2SD1819(RS)	TRANSISTOR
	Q4	2SC3936(BC)	TRANSISTOR
	Q5	2SC3936(BC)	TRANSISTOR
	Q6	2SC3936(BC)	TRANSISTOR
	Q7	2SC3936(BC)	TRANSISTOR
	Q8	2SC3936(BC)	TRANSISTOR
	Q9	2SC3936(BC)	TRANSISTOR
	Q10	2SC3936(BC)	TRANSISTOR
	Q11	2SA1532(BC)	TRANSISTOR
	Q13	2SC3936(BC)	TRANSISTOR
	Q14	2SA1532(BC)	TRANSISTOR
	Q15	2SA1532(BC)	TRANSISTOR
	Q16	2SA1532(BC)	TRANSISTOR
	Q17	2SA1532(BC)	TRANSISTOR
	D2	RB451F	DIODE
	D3	MA141WK	DIODE
	D4	1SS133	DIODE
	R1	QRSA08J-153YN	RESISTOR
	R2	QRSA08J-562YN	RESISTOR
	R3	QRSA08J-222YN	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R4	QRSA08J-103YN	RESISTOR
	R5	QRSA08J-563YN	RESISTOR
	R6	QRSA08J-124YN	RESISTOR
	R7	QRSA08J-681YN	RESISTOR
	R8	QRSA08J-105YN	RESISTOR
	R9	QRSA08J-0R0Y	RESISTOR
	R11	QRSA08J-222YN	RESISTOR
	R12	QRSA08J-152YN	RESISTOR
	R15	QRSA08J-101YN	RESISTOR
	R16	QRSA08J-152YN	RESISTOR
	R17	QRSA08J-472YN	RESISTOR
	R18	QRSA08J-103YN	RESISTOR
	R19	QRSA08J-472YN	RESISTOR
	R20	QRSA08J-103YN	RESISTOR
	R21	QRSA08J-472YN	RESISTOR
	R22	QRSA08J-103YN	RESISTOR
	R23	QRSA08J-103YN	RESISTOR
	R24	QRSA08J-183YN	RESISTOR
	R27	NRVA62D-181N	RESISTOR
	R28	QRSA08J-332YN	RESISTOR
	R29	NRVA62D-181N	RESISTOR
	R30	QRSA08J-332YN	RESISTOR
	R31	NRVA62D-271N	RESISTOR
	R32	QRSA08J-272YN	RESISTOR
	R33	QRSA08J-223YN	RESISTOR
	R34	QRSA08J-564YN	RESISTOR
	R35	QRSA08J-0R0Y	RESISTOR
	R36	NRVA62D-102N	RESISTOR
	R37	NRVA62D-102N	RESISTOR
	R38	NRVA62D-102N	RESISTOR
	R39	NVP1302-103N	V RESISTOR,R/B SEPA
	R40	QRSA08J-474YN	RESISTOR
	R41	QRSA08J-122YN	RESISTOR
	R42	QRSA08J-473YN	RESISTOR
	R43	QRSA08J-103YN	RESISTOR
	R44	QRSA08J-122YN	RESISTOR
	R45	QRSA08J-103YN	RESISTOR
	R46	QRSA08J-684YN	RESISTOR
	R47	QRSA08J-273YN	RESISTOR
	R48	QRSA08J-103YN	RESISTOR
	R49	QRSA08J-103YN	RESISTOR
	R50	QRSA08J-123YN	RESISTOR
	R51	QRSA08J-103YN	RESISTOR
	R52	QRSA08J-103YN	RESISTOR
	R53	NVP1302-222N	V RESISTOR,IRIS
	R54	QRSA08J-223YN	RESISTOR
	R55	NRVA62D-302N	RESISTOR
	R56	QRSA08J-472YN	RESISTOR
	R57	QRSA08J-222YN	RESISTOR
	R58	QRSA08J-822YN	RESISTOR
	R59	NRVA62D-102N	RESISTOR
	R60	QRSA08J-0R0Y	RESISTOR
	R61	QRSA08J-332YN	RESISTOR
	R65	QRSA08J-333YN	RESISTOR
	R66	QRSA08J-0R0Y	RESISTOR
	R67	NRVA62D-821N	RESISTOR
	R68	NRVA62D-821N	RESISTOR
	R69	NRVA62D-272N	RESISTOR
	R70	QRSA08J-152YN	RESISTOR
	R71	NRVA62D-102N	RESISTOR
	R72	QRSA08J-104YN	RESISTOR
	R73	QRSA08J-0R0Y	RESISTOR
	R74	QRSA08J-100YN	RESISTOR
	R75	QRSA08J-100YN	RESISTOR
	R76	QRSA08J-101YN	RESISTOR
	R77	QRSA08J-101YN	RESISTOR
	R78	QRSA08J-101YN	RESISTOR
	R79	QRSA08J-101YN	RESISTOR
	R80	QRSA08J-101YN	RESISTOR
	R81	QRSA08J-101YN	RESISTOR
	R82	QRSA08J-223YN	RESISTOR
	R83	QRSA08J-223YN	RESISTOR
	R84	QRSA08J-223YN	RESISTOR
	R85	QRSA08J-223YN	RESISTOR
	R86	NRSA63J-0R0A	RESISTOR
	C1	QCFA1EZ-104	CAPACITOR
	C2	NEH11CM-106NZ	E CAPACITOR
	C3	QCFA1EZ-104	CAPACITOR
	C4	QEF81VM-105	TANTAL CAPACITOR
	C5	NEH11CM-476NP	E CAPACITOR
	C6	QCFA1EZ-104	CAPACITOR
	C7	NEH11CM-106NZ	E CAPACITOR
	C8	QCFA1EZ-104	CAPACITOR
	C9	NEH11CM-106NZ	E CAPACITOR
	C10	QCFA1EZ-104	CAPACITOR
	C11	NEH10JM-226NZ	E CAPACITOR
	C12	QCFA1EZ-104	CAPACITOR
	C13	QCFA1EZ-104	CAPACITOR
	C14	QCTA1CH-330	CAPACITOR
	C15	QCFA1EZ-104	CAPACITOR
	C18	QCFA1EZ-104	CAPACITOR
	C19	NEH10JM-226NZ	E CAPACITOR
	C20	QCTA1CH-100	CAPACITOR
	C22	QCTA1CH-100	CAPACITOR
	C23	QCFA1EZ-104	CAPACITOR
	C25	QCFA1EZ-104	CAPACITOR
	C26	NEH10JM-226NZ	E CAPACITOR
	C27	QCTA1CH-560	CAPACITOR
	C28	QCFA1EZ-104	CAPACITOR
	C29	NEH10JM-226NZ	E CAPACITOR
	C30	QCFA1EZ-104	CAPACITOR
	C31	QCTA1CH-560	CAPACITOR
	C32	QCTA1CH-221	CAPACITOR
	C33	QCTA1CH-221	CAPACITOR
	C34	QCFA1EZ-104	CAPACITOR
	C35	QCFA1EZ-104	CAPACITOR
	C36	QCFA1EZ-104	CAPACITOR
	C37	QCFA1EZ-104	CAPACITOR
	C38	NEH10JM-226NZ	E CAPACITOR
	C39	QCFA1EZ-104	CAPACITOR
	C40	QCFA1EZ-104	CAPACITOR
	C41	NEH10JM-107NP	E CAPACITOR
	C42	NEH10JM-226NZ	E CAPACITOR
	C43	QCFA1EZ-104	CAPACITOR
	C44	NEH11EM-475NZ	E CAPACITOR
	C45	NEH11HM-225NZ	E CAPACITOR
	C46	NEH11HM-225NZ	E CAPACITOR
	C47	NEH10JM-226NZ	E CAPACITOR
	C48	NEH11EM-475NZ	E CAPACITOR
	C49	NEH11EM-475NZ	E CAPACITOR
	C50	QCFA1EZ-104	CAPACITOR
	C51	NEH10JM-226NZ	E CAPACITOR
	C52	NEH10JM-107NP	E CAPACITOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C53	QCFA1EZ-104	CAPACITOR
	C54	NEH11EM-475NZ	E CAPACITOR
	C55	QCF81CZ-105	CAPACITOR
	C56	QCFA1EZ-104	CAPACITOR
	C57	QCYA1HK-103	CAPACITOR
	C58	QCFA1EZ-104	CAPACITOR
	C59	NEH10JM-226NZ	E CAPACITOR
	C61	QCFA1EZ-104	CAPACITOR
	C62	QCTA1CH-101	CAPACITOR
	C63	NEH10JM-226NZ	E CAPACITOR
	L1	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L2	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L3	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L4	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L5	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L6	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L7	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L8	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L9	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L10	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L11	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	LPF1	YU40657	LOW PASS FILTER
	OR	YU40798-R	LOW PASS FILTER
	LPF2	YU40658	LOW PASS FILTER
	OR	YU40799-Z	LOW PASS FILTER
	LPF3	YU40658	LOW PASS FILTER
	OR	YU40799-Z	LOW PASS FILTER
	LPF4	YU40660	LOW PASS FILTER
	OR	YU40800-Z	LOW PASS FILTER
⚠	X1	YU40812	CHIP CRYSTAL
	TP1	YU40581-AY	CHIP TP(2125)
	CN-S1	YU40663-6	CAP HOUSING
	CN-S2	PU58655-4	CAP HOUSING
	CN-S3	PU58654-4	CAP HOUSING
	CN-S4	YU40664-26	CAP HOUSING
	CN-S5	YU40662	CCD SOCKET

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VIDEO BOARD ASSEMBLY <22>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20089E-02-C	VIDEO BOARD ASSY
	IC1	HA118025MP	IC
	IC2	MSM6865MS	IC
	IC3	MSM6869MS	IC
	IC4	UPC2371GH	IC
	IC5	HA118056MP	IC
	IC6	UPD4053BG	IC
	OR	BU4053BF	IC
	IC7	UPC324G2	IC
	OR	AN1324NS	IC
	IC8	UPD74HC00G	IC
	IC9	TC4S71F	IC
	IC10	TC4S69F	IC
	Q1	2SC3936(BC)	TRANSISTOR
	Q2	2SA1532(BC)	TRANSISTOR
	Q3	2SC3936(BC)	TRANSISTOR
	Q4	2SA1532(BC)	TRANSISTOR
	Q5	2SA1532(BC)	TRANSISTOR
	Q6	2SA1532(BC)	TRANSISTOR
	Q8	2SC3936(BC)	TRANSISTOR
	Q9	2SC3936(BC)	TRANSISTOR
	Q10	2SC3936(BC)	TRANSISTOR
	Q11	2SC3936(BC)	TRANSISTOR
	Q12	2SC3936(BC)	TRANSISTOR
	Q13	2SC3936(BC)	TRANSISTOR
	Q14	2SC3936(BC)	TRANSISTOR
	Q15	2SC3936(BC)	TRANSISTOR
	Q16	2SC3936(BC)	TRANSISTOR
	Q17	2SA1532(BC)	TRANSISTOR
	Q18	2SC3936(BC)	TRANSISTOR
	Q19	2SC3936(BC)	TRANSISTOR
	Q20	2SC3936(BC)	TRANSISTOR
	Q21	2SC3936(BC)	TRANSISTOR
	Q22	2SC3936(BC)	TRANSISTOR
	D1	MA141WK	DIODE
	D2	MA141A	DIODE
	D3	MA141K	DIODE
	D4	MA141K	DIODE
	D5	MA141A	DIODE
	D6	MA141WK	DIODE
	R1	NVP1302-332N	V RESISTOR,1H DL SIG.LEVEL
	R2	QRSA08J-332YN	RESISTOR
	R3	QRSA08J-102YN	RESISTOR
	R4	QRSA08J-562YN	RESISTOR
	R5	QRSA08J-102YN	RESISTOR
	R6	NVP1302-332N	V RESISTOR,DIF.SIG.BALANCE
	R7	QRSA08J-332YN	RESISTOR
	R8	QRSA08J-102YN	RESISTOR
	R9	QRSA08J-562YN	RESISTOR
	R10	QRSA08J-102YN	RESISTOR
	R11	QRSA08J-272YN	RESISTOR
	R12	QRSA08J-332YN	RESISTOR
	R13	QRSA08J-272YN	RESISTOR
	R15	QRSA08J-103YN	RESISTOR
	R16	QRSA08J-472YN	RESISTOR
	R17	QRSA08J-102YN	RESISTOR
	R18	NVP1302-103N	V RESISTOR,B.CARR
	R19	NVP1302-103N	V RESISTOR,R.CARR
	R20	QRSA08J-102YN	RESISTOR
	R21	QRSA08J-103YN	RESISTOR
	R22	NVP1302-103N	V RESISTOR,COLOR OFF SET
	R23	QRSA08J-103YN	RESISTOR
	R24	QRSA08J-102YN	RESISTOR
	R25	NVP1302-103N	V RESISTOR,B-Y LEVEL

# △	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R26	QRSA08J-102YN	RESISTOR
	R27	QRSA08J-393YN	RESISTOR
	R28	QRSA08J-333YN	RESISTOR
	R30	QRSA08J-333YN	RESISTOR
	R31	QRSA08J-223YN	RESISTOR
	R32	QRSA08J-223YN	RESISTOR
	R33	QRSA08J-473YN	RESISTOR
	R35	QRSA08J-333YN	RESISTOR
	R36	QRSA08J-102YN	RESISTOR
	R37	QRSA08J-103YN	RESISTOR
	R38	QRSA08J-392YN	RESISTOR
	R39	QRSA08J-102YN	RESISTOR
	R40	QRSA08J-103YN	RESISTOR
	R41	QRSA08J-392YN	RESISTOR
	R42	QRSA08J-333YN	RESISTOR
	R43	QRSA08J-223YN	RESISTOR
	R44	QRSA08J-103YN	RESISTOR
	R45	QRSA08J-393YN	RESISTOR
	R46	QRSA08J-102YN	RESISTOR
	R47	QRSA08J-102YN	RESISTOR
	R48	NRVA62D-332N	RESISTOR
	R50	NRVA62D-822N	RESISTOR
	R51	QRSA08J-183YN	RESISTOR
	R52	QRSA08J-333YN	RESISTOR
	R53	QRSA08J-333YN	RESISTOR
	R54	QRSA08J-273YN	RESISTOR
	R55	NRVA62D-273N	RESISTOR
	R56	NRVA62D-163N	RESISTOR
	R57	QRSA08J-102YN	RESISTOR
	R58	QRSA08J-102YN	RESISTOR
	R59	QRSA08J-222YN	RESISTOR
	R60	QRSA08J-222YN	RESISTOR
	R61	QRSA08J-103YN	RESISTOR
	R62	QRSA08J-103YN	RESISTOR
	R63	QRSA08J-222YN	RESISTOR
	R64	QRSA08J-102YN	RESISTOR
	R65	QRSA08J-102YN	RESISTOR
	R66	NVP1302-472N	V RESISTOR, BURST LEVEL
	R67	QRSA08J-102YN	RESISTOR
	R68	QRSA08J-102YN	RESISTOR
	R69	QRSA08J-102YN	RESISTOR
	R70	NRVA62D-332N	RESISTOR
	R71	NRVA62D-473N	RESISTOR
	R72	NRVA62D-182N	RESISTOR
	R73	NVP1302-153N	V RESISTOR, B SET UP
	R74	QRSA08J-103YN	RESISTOR
	R75	NVP1302-153N	V RESISTOR,R SET UP
	R76	QRSA08J-223YN	RESISTOR
	R77	NVP1302-103N	V RESISTOR, BURST PHASE
	R78	NVP1302-102N	V RESISTOR, COLOR LEVEL
	R79	QRSA08J-0R0Y	RESISTOR
	R80	QRSA08J-103YN	RESISTOR
	R81	NRVA62D-123N	RESISTOR
	R82	NRVA62D-622N	RESISTOR
	R83	QRSA08J-103YN	RESISTOR
	R84	QRSA08J-332YN	RESISTOR
	R85	QRSA08J-223YN	RESISTOR
	R86	NRVA62D-562N	RESISTOR
	R87	QRSA08J-222YN	RESISTOR
	R88	QRSA08J-562YN	RESISTOR
	R89	QRSA08J-821YN	RESISTOR
	R90	QRSA08J-562YN	RESISTOR
	R91	QRSA08J-333YN	RESISTOR
	R92	QRSA08J-183YN	RESISTOR
	R93	QRSA08J-102YN	RESISTOR
	R94	NRVA62D-132N	RESISTOR
	R95	QRSA08J-392YN	RESISTOR
	R96	QRSA08J-562YN	RESISTOR
	R97	QRSA08J-562YN	RESISTOR
	R98	QRSA08J-562YN	RESISTOR
	R99	QRSA08J-103YN	RESISTOR
	R100	QRSA08J-822YN	RESISTOR
	R101	QRSA08J-562YN	RESISTOR
	R102	QRSA08J-102YN	RESISTOR
	R103	NRVA62D-242N	RESISTOR
	R104	NRVA62D-181N	RESISTOR
	R105	NRVA62D-271N	RESISTOR
	R106	NRVA62D-222N	RESISTOR
	R107	QRSA08J-562YN	RESISTOR
	R108	QRSA08J-562YN	RESISTOR
	R109	QRSA08J-122YN	RESISTOR
	R110	QRSA08J-122YN	RESISTOR
	R111	QRSA08J-332YN	RESISTOR
	R114	QRSA08J-182YN	RESISTOR
	R117	QRSA08J-0R0Y	RESISTOR
	R120	QRSA08J-123YN	RESISTOR
	R121	QRSA08J-333YN	RESISTOR
	R124	QRSA08J-123YN	RESISTOR
	R125	QRSA08J-333YN	RESISTOR
	R128	QRSA08J-333YN	RESISTOR
	R129	NVP1302-473N	V RESISTOR, R GAIN
	R130	QRSA08J-223YN	RESISTOR
	R131	NVP1302-473N	V RESISTOR, B GAIN
	R132	NRVA62D-563N	RESISTOR
	R133	NRVA62D-273N	RESISTOR
	R134	NRVA62D-472N	RESISTOR
	R135	QRSA08J-103YN	RESISTOR
	R136	QRSA08J-103YN	RESISTOR
	R137	QRSA08J-473YN	RESISTOR
	R139	QRSA08J-103YN	RESISTOR
	R140	QRSA08J-183YN	RESISTOR
	R141	QRSA08J-393YN	RESISTOR
	R142	QRSA08J-100YN	RESISTOR
	R143	QRSA08J-100YN	RESISTOR
	R144	QRSA08J-105YN	RESISTOR
	R145	QRSA08J-102YN	RESISTOR
	R146	NRVA62D-243N	RESISTOR
	R147	NRVA62D-223N	RESISTOR
	R148	NRVA62D-123N	RESISTOR
	R149	NRVA62D-473N	RESISTOR
	R150	NRVA62D-473N	RESISTOR
	R151	NRVA62D-123N	RESISTOR
	R152	NRVA62D-223N	RESISTOR
	R153	NRVA62D-243N	RESISTOR
	R154	QRSA08J-102YN	RESISTOR
	R155	QRSA08J-472YN	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R157	QRSA08J-333YN	RESISTOR
	R158	QRSA08J-563YN	RESISTOR
	R159	QRSA08J-823YN	RESISTOR
	R160	QRSA08J-102YN	RESISTOR
	R161	QRSA08J-472YN	RESISTOR
	R162	QRSA08J-273YN	RESISTOR
	R163	QRSA08J-333YN	RESISTOR
	R166	QRSA08J-394YN	RESISTOR
	R167	QRD161J-335	RESISTOR
	R200	QRD161J-223	RESISTOR
	B1	QRSA08J-0R0Y	RESISTOR
	B2	QRSA08J-0R0Y	RESISTOR
	B3	QRSA08J-0R0Y	RESISTOR
	B4	QRSA08J-0R0Y	RESISTOR
	B5	QRSA08J-0R0Y	RESISTOR
	B6	QRSA08J-0R0Y	RESISTOR
	B7	QRSA08J-0R0Y	RESISTOR
	B9	QRSA08J-0R0Y	RESISTOR
	B10	QRSA08J-0R0Y	RESISTOR
	C1	QCFA1EZ-104	CAPACITOR
	C2	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C3	QCFA1EZ-104	CAPACITOR
	C4	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C5	QCFA1EZ-104	CAPACITOR
	C6	QCFA1EZ-104	CAPACITOR
	C7	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C8	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C9	QCYA1HK-103	CAPACITOR
	C10	QCYA1HK-103	CAPACITOR
	C11	QEF81VM-224	TANTAL CAPACITOR
	C12	QEF80JM-225	TANTAL CAPACITOR
	C13	QCYA1HK-103	CAPACITOR
	C14	QCYA1HK-103	CAPACITOR
	C15	QEF81VM-224	TANTAL CAPACITOR
	C16	QEF80JM-225	TANTAL CAPACITOR
	C17	QCFA1EZ-104	CAPACITOR
	C18	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C19	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C20	QCFA1EZ-104	CAPACITOR
	C21	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C22	QCYA1HK-103	CAPACITOR
	C23	QCYA1HK-103	CAPACITOR
	C24	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C25	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C26	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C27	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C28	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C29	QCYA1HK-103	CAPACITOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C30	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C31	NEH10GM-336NZ	E CAPACITOR
	C32	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C33	QCYA1HK-103	CAPACITOR
	C34	QCYA1HK-103	CAPACITOR
	C35	QCYA1HK-103	CAPACITOR
	C37	QCYA1HK-103	CAPACITOR
	C38	QCYA1HK-103	CAPACITOR
	C39	QCYA1HK-103	CAPACITOR
	C40	QCF81CZ-105	CAPACITOR
	C41	QCTA1CH-220	CAPACITOR
	C42	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C43	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C44	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C45	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C46	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C47	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C48	NEH11CM-106NZ	E CAPACITOR
	OR	NEA21CM-106NZ	E CAPACITOR
	C49	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C50	QCFA1EZ-104	CAPACITOR
	C51	QCFA1EZ-104	CAPACITOR
	C52	QCFA1EZ-104	CAPACITOR
	C53	QCFA1EZ-104	CAPACITOR
	C54	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C55	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C56	QCFA1EZ-104	CAPACITOR
	C57	QCYA1HK-103	CAPACITOR
	C58	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C60	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C61	QCFA1EZ-104	CAPACITOR
	C62	QEF80GM-475	TANTAL CAPACITOR
	C63	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C64	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C65	PU59913-473K	CAPACITOR
	OR	NCR21CK-473A	CAPACITOR
	C66	QEF80JM-225	TANTAL CAPACITOR
	C67	QEF80JM-225	TANTAL CAPACITOR
	C68	QEF80JM-225	TANTAL CAPACITOR
	C69	QCTA1CH-101	CAPACITOR
	C70	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C71	QCFA1EZ-104	CAPACITOR
	C72	QEF81CM-105	TANTAL CAPACITOR
	C73	QCFA1EZ-104	TANTAL CAPACITOR
	C74	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C75	NEH10JM-226NZ	E CAPACITOR
	OR	NEA20JM-226NZ	E CAPACITOR
	C76	QER40JM-476	E CAPACITOR
	C77	QCTA1CH-101	CAPACITOR
	C78	QCS11HJ-390	CAPACITOR
	C79	QCTA1CH-390	CAPACITOR
	L1	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L2	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L3	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L4	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L5	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L6	YU40248-220KY	COIL
	L7	PU57361-150K	COIL
	EQ1	YU40655	DELAY LINE
	LPF5	YU40810	LOW PASS FILTER
	LPF6	YU40811	LOW PASS FILTER
	SPC1	YQM30029-17	SPACER
	TP1	YU40581-AY	CHIP TP(2125)
	TP2	YU40581-AY	CHIP TP(2125)
	TP3	YU40581-AY	CHIP TP(2125)
	TP4	YU40581-AY	CHIP TP2125)
	CN-V1	YU40663-10	CONNECTOR
	CN-V2	YU40667-12	CONNECTOR
	CN-V3	YU40667-12	CONNECTOR
	CN-V4	YU40663-26	CONNECTOR
	CN-V5	YU40670-14	CONNECTOR

—COUNT DOWN BOARD ASSEMBLY—

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB30044A-C	COUNT DOWN BOARD ASSY
	IC101	UPD4024BG	IC
	Q101	S-8054HN	IC
	R208	QWE293-04A1A1	BUS WIRE
	R301	QRSA08J-102YN	RESISTOR
	R302	QRSA08J-223YN	RESISTOR
	C301	QCFA1EZ-104	CAPACITOR

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AF BOARD ASSEMBLY <23>

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20093B-02-C	AF PWB ASSY
	IC1	HA13475MP	IC
	IC3	TA8409F	IC
	IC4	UPC319G2	IC
	IC5	HA118020MA	IC
	IC6	TC4S71F	IC
	IC7	UPD78C14AG-043	IC
	IC8	MN12821(QR)	IC
	Q1	2SC3936(BC)	TRANSISTOR
	Q2	2SA1532(BC)	TRANSISTOR
	Q3	2SA1532(BC)	TRANSISTOR
	Q4	2SC3936(BC)	TRANSISTOR
	Q5	2SC3936(BC)	TRANSISTOR
	Q6	2SC3936(BC)	TRANSISTOR
	Q7	2SA1532(BC)	TRANSISTOR
	Q8	DTA114EU	TRANSISTOR
	Q10	2SD1819(QR)	TRANSISTOR
	Q11	2SD1819(QR)	TRANSISTOR
	D1	MA141WA	DIODE
	D2	1SS133	DIODE
	R1	NRSA63J-103N	RESISTOR
	R2	NRSA63J-103N	RESISTOR
	R3	NRSA63J-103N	RESISTOR
	R4	NRSA63J-103N	RESISTOR
	R5	NRSA63J-103N	RESISTOR
	R14	NRSA63J-101N	RESISTOR
	R15	NRSA63J-103N	RESISTOR
	R16	NRSA63J-223N	RESISTOR
	R17	NRSA63J-103N	RESISTOR
	R18	NRSA63J-103N	RESISTOR
	R19	NRSA63J-392N	RESISTOR
	R20	NRSA63J-822N	RESISTOR
	R21	NRSA63J-822N	RESISTOR
	R22	NRSA63J-222N	RESISTOR
	R23	NRSA63J-102N	RESISTOR
	R24	NRSA63J-102N	RESISTOR
	R25	NRSA63J-223N	RESISTOR
	R26	NRSA63J-223N	RESISTOR
	R27	NRSA63J-153N	RESISTOR
	R28	NRSA63J-102N	RESISTOR
	R29	NRSA63J-472N	RESISTOR
	R30	NRSA63J-222N	RESISTOR
	R31	NRSA63J-122N	RESISTOR
	R32	NRSA63J-152N	RESISTOR
	R33	NRSA63J-102N	RESISTOR
	R34	NRSA63J-472N	RESISTOR
	R35	NRSA63J-103N	RESISTOR
	R36	NRSA63J-122N	RESISTOR
	R37	NRSA63J-562N	RESISTOR
	R38	NRSA63J-153N	RESISTOR
	R39	NRSA63J-333N	RESISTOR
	R40	NRSA63J-152N	RESISTOR
	R41	NRSA63J-472N	RESISTOR
	R42	NRSA63J-821N	RESISTOR
	R43	NRSA63J-102N	RESISTOR
	R44	NRSA63J-472N	RESISTOR
	R45	NRSA63J-472N	RESISTOR
	R46	NRSA63J-122N	RESISTOR
	R47	NRSA63J-562N	RESISTOR
	R48	NRSA63J-102N	RESISTOR
	R50	NRSA63J-562N	RESISTOR
	R51	NRSA63J-103N	RESISTOR
	R54	NRSA63J-822N	RESISTOR
	R56	NRSA63J-103N	RESISTOR
	R57	NRSA63J-103N	RESISTOR

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R58	NRSA63J-103N	RESISTOR
	R59	NRSA63J-103N	RESISTOR
	R60	NRSA63J-103N	RESISTOR
	R61	NRSA63J-103N	RESISTOR
	R62	NRSA63J-103N	RESISTOR
	R63	NRSA63J-103N	RESISTOR
	R64	NRSA63J-472N	RESISTOR
	R65	NRSA63J-104N	RESISTOR
	R66	NRSA63J-100N	RESISTOR
	R67	NRSA63J-105N	RESISTOR
	R68	YU40808-153X	RESISTOR
	R69	NRSA63J-0R0A	RESISTOR
	R70	NRSA63J-472N	RESISTOR
	R71	NRSA63J-103N	RESISTOR
	R72	NRSA63J-182N	RESISTOR
	R73	NRSA63J-222N	RESISTOR
	R74	NRSA63J-471N	RESISTOR
	R75	NRSA63J-473N	RESISTOR
	R76	NRSA63J-0R0A	RESISTOR
	R77	NRSA63J-0R0A	RESISTOR
	R79	NRSA63J-0R0A	RESISTOR
	R80	QRD161J-104	RESISTOR
⚠	R81	PU52108-100	POSITIVE THERMISTOR
	C1	NEH11CM-106NZ	E CAPACITOR
	C2	NCF31CZ-104A	CAPACITOR
	C3	NEH10JM-107NP	E CAPACITOR
	C4	NCF31CZ-104A	CAPACITOR
	C5	NCF31CZ-104A	CAPACITOR
	C6	NCF31CZ-104A	CAPACITOR
	C7	PU59913-473K	CAPACITOR
	C8	NCF31CZ-104A	CAPACITOR
	C9	NCF31CZ-104A	CAPACITOR
	C10	NCF31CZ-104A	CAPACITOR
	C11	NEH10JM-226NZ	E CAPACITOR
	C12	NCF31CZ-104A	CAPACITOR
	C13	NCT07CH-121A	CAPACITOR
	C14	NCT07CH-330A	CAPACITOR
	C15	PU59758-105	CAPACITOR
	C16	NCT07CH-330A	CAPACITOR
	C17	NCB31CK-223A	CAPACITOR
	C18	QEF80GM-685	E CAPACITOR
	C19	NCR31CK-223A	CAPACITOR
	C20	QEF80GM-685	TANTAL CAPACITOR
	C21	QEF80GM-685	E CAPACITOR
	C22	NCR31CK-223A	CAPACITOR
	C23	QEF80GM-685	E CAPACITOR
	C24	QEF80GM-685	E CAPACITOR
	C25	NCB31CK-223A	CAPACITOR
	C26	QEF80GM-685	TANTAL CAPACITOR
	C27	QEF80GM-685	E CAPACITOR
	C28	PU59913-473K	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	QEF80GM-685	TANTAL CAPACITOR
	C31	QEF80GM-685	E CAPACITOR
	C32	QEF80GM-685	E CAPACITOR
	C33	NCB31EK-103A	CAPACITOR
	C34	NCB31CK-223A	CAPACITOR
	C35	NCB31EK-103A	CAPACITOR
	C36	YU40978	CAPACITOR, 0.1
	C37	NCS31HJ-331A	CAPACITOR
	C38	YU40978	CAPACITOR, 0.1

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C39	NCF31CZ-104A	CAPACITORCF
	C40	NCS31HJ-331A	CAPACITOR
	C41	YU40978	CAPACITOR, 0.1
	C42	NCS31HJ-331A	CAPACITOR
	C43	YU40978	CAPACITOR, 0.1
	C44	NCS31HJ-331A	CAPACITOR
	C45	QEF80GM-685	TANTAL CAPACITOR
	C46	NEH10JM-226NZ	E CAPACITOR
	C47	NCF31CZ-104A	CAPACITOR
	C48	NCT07CH-101A	CAPACITOR
	C49	NCT07CH-220A	CAPACITOR
	C50	NCT07CH-220A	CAPACITOR
	C52	NCB31EK-103A	CAPACITOR
	C53	NCB31EK-103A	CAPACITOR
	C54	NCB31EK-103A	CAPACITOR
	C55	NCB31EK-103A	CAPACITOR
	C56	NCB31EK-103A	CAPACITOR
	C57	NCB31EK-103A	CAPACITOR
	C58	NEH10JM-226NZ	E CAPACITOR
	C59	NCF31CZ-104A	CAPACITOR
	C60	NCF31CZ-104A	CAPACITOR
	C61	NCB31EK-103A	CAPACITOR
	C62	NCB31HK-102A	CAPACITOR
	C63	QCS11HJ-330	CAPACITOR
	C71	PU58948-104	CAPACITOR
	L2	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L3	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L4	PU58201-121K	COIL
	L5	YU40740-470KY	COIL
	OR	YU40248-470KY	COIL
	L6	YU40740-470KY	COIL
	OR	YU40248-470KY	COIL
	L7	PU58201-330K	COIL
	BPF1	YU40700	CHIP FILTER
	OR	YU40703	CHIP FILTER
	BPF2	YU40701	CHIP FILTER
	OR	YU40704	CHIP FILTER
⚠	X1	YU40818	CRYSTAL UNIT
⚠	OR	YU40819	CRYSTAL UNIT
	CN-1	PU58655-4	CAP HOUSING
	CN-2	YU40670-14	BOARD TO BOARD
	CN-3	PU58655-2	CAP HOUSING
	CN-4	PU58655-3	CAP HOUSING
	CN-5	PU58655-4	CAP HOUSING
	CN-6	PU58655-3	CAP HOUSING
	CN-7	PU58655-3	CAP HOUSING

#	⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
		R58	NRSA63J-103N	RESISTOR
		R59	NRSA63J-103N	RESISTOR
		R60	NRSA63J-103N	RESISTOR
		R61	NRSA63J-103N	RESISTOR
		R62	NRSA63J-103N	RESISTOR
		R63	NRSA63J-103N	RESISTOR
		R64	NRSA63J-472N	RESISTOR
		R65	NRSA63J-104N	RESISTOR
		R66	NRSA63J-100N	RESISTOR
		R67	NRSA63J-105N	RESISTOR
		R68	YU40808-153X	RESISTOR
		R69	NRSA63J-0R0A	RESISTOR
		R70	NRSA63J-472N	RESISTOR
		R71	NRSA63J-103N	RESISTOR
		R72	NRSA63J-182N	RESISTOR
		R73	NRSA63J-222N	RESISTOR
		R74	NRSA63J-471N	RESISTOR
		R75	NRSA63J-473N	RESISTOR
		R76	NRSA63J-0R0A	RESISTOR
		R77	NRSA63J-0R0A	RESISTOR
		R79	NRSA63J-0R0A	RESISTOR
		R80	QRD161J-104	RESISTOR
	⚠	R81	PU52108-100	POSITIVE THERMISTOR
		C1	NEH11CM-106NZ	E CAPACITOR
		C2	NCF31CZ-104A	CAPACITOR
		C3	NEH10JM-107NP	E CAPACITOR
		C4	NCF31CZ-104A	CAPACITOR
		C5	NCF31CZ-104A	CAPACITOR
		C6	NCF31CZ-104A	CAPACITOR
		C7	PU59913-473K	CAPACITOR
		C8	NCF31CZ-104A	CAPACITOR
		C9	NCF31CZ-104A	CAPACITOR
		C10	NCF31CZ-104A	CAPACITOR
		C11	NEH10JM-226NZ	E CAPACITOR
		C12	NCF31CZ-104A	CAPACITOR
		C13	NCT07CH-121A	CAPACITOR
		C14	NCT07CH-330A	CAPACITOR
		C15	PU59758-105	CAPACITOR
		C16	NCT07CH-330A	CAPACITOR
		C17	NCB31CK-223A	CAPACITOR
		C18	QEF80GM-685	E CAPACITOR
		C19	NCR31CK-223A	CAPACITOR
		C20	QEF80GM-685	TANTAL CAPACITOR
		C21	QEF80GM-685	E CAPACITOR
		C22	NCR31CK-223A	CAPACITOR
		C23	QEF80GM-685	E CAPACITOR
		C24	QEF80GM-685	E CAPACITOR
		C25	NCB31CK-223A	CAPACITOR
		C26	QEF80GM-685	TANTAL CAPACITOR
		C27	QEF80GM-685	E CAPACITOR
		C28	PU59913-473K	CAPACITOR
		C29	NCB31EK-103A	CAPACITOR
		C30	QEF80GM-685	TANTAL CAPACITOR
		C31	QEF80GM-685	E CAPACITOR
		C32	QEF80GM-685	E CAPACITOR
		C33	NCB31EK-103A	CAPACITOR
		C34	NCB31CK-223A	CAPACITOR
		C35	NCB31EK-103A	CAPACITOR
		C36	YU40978	CAPACITOR, 0.1
		C37	NCS31HJ-331A	CAPACITOR
		C38	YU40978	CAPACITOR, 0.1
		C39	NCF31CZ-104A	CAPACITORCF
		C40	NCS31HJ-331A	CAPACITOR
		C41	YU40978	CAPACITOR, 0.1
		C42	NCS31HJ-331A	CAPACITOR
		C43	YU40978	CAPACITOR, 0.1
		C44	NCS31HJ-331A	CAPACITOR
		C45	QEF80GM-685	TANTAL CAPACITOR
		C46	NEH10JM-226NZ	E CAPACITOR
		C47	NCF31CZ-104A	CAPACITOR
		C48	NCT07CH-101A	CAPACITOR
		C49	NCT07CH-220A	CAPACITOR
		C50	NCT07CH-220A	CAPACITOR
		C52	NCB31EK-103A	CAPACITOR
		C53	NCB31EK-103A	CAPACITOR
		C54	NCB31EK-103A	CAPACITOR
		C55	NCB31EK-103A	CAPACITOR
		C56	NCB31EK-103A	CAPACITOR
		C57	NCB31EK-103A	CAPACITOR
		C58	NEH10JM-226NZ	E CAPACITOR
		C59	NCF31CZ-104A	CAPACITOR
		C60	NCF31CZ-104A	CAPACITOR
		C61	NCB31EK-103A	CAPACITOR
		C62	NCB31HK-102A	CAPACITOR
		C63	QCS11HJ-330	CAPACITOR
		C71	PU58948-104	CAPACITOR
		L2	YU40740-220KY	COIL
			OR YU40248-220KY	COIL
		L3	YU40740-220KY	COIL
			OR YU40248-220KY	COIL
		L4	PU58201-121K	COIL
		L5	YU40740-470KY	COIL
			OR YU40248-470KY	COIL
		L6	YU40740-470KY	COIL
			OR YU40248-470KY	COIL
		L7	PU58201-330K	COIL
		BPF1	YU40700	CHIP FILTER
			OR YU40703	CHIP FILTER
		BPF2	YU40701	CHIP FILTER
			OR YU40704	CHIP FILTER
	⚠	X1	YU40818	CRYSTAL UNIT
	⚠		OR YU40819	CRYSTAL UNIT
		CN-1	PU58655-4	CAP HOUSING
		CN-2	YU40670-14	BOARD TO BOARD
		CN-3	PU58655-2	CAP HOUSING
		CN-4	PU58655-3	CAP HOUSING
		CN-5	PU58655-4	CAP HOUSING
		CN-6	PU58655-3	CAP HOUSING
		CN-7	PU58655-3	CAP HOUSING

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	R58	NRSA63J-103N	RESISTOR
	R59	NRSA63J-103N	RESISTOR
	R60	NRSA63J-103N	RESISTOR
	R61	NRSA63J-103N	RESISTOR
	R62	NRSA63J-103N	RESISTOR
	R63	NRSA63J-103N	RESISTOR
	R64	NRSA63J-472N	RESISTOR
	R65	NRSA63J-104N	RESISTOR
	R66	NRSA63J-100N	RESISTOR
	R67	NRSA63J-105N	RESISTOR
	R68	YU40808-153X	RESISTOR
	R69	NRSA63J-0R0A	RESISTOR
	R70	NRSA63J-472N	RESISTOR
	R71	NRSA63J-103N	RESISTOR
	R72	NRSA63J-182N	RESISTOR
	R73	NRSA63J-222N	RESISTOR
	R74	NRSA63J-471N	RESISTOR
	R75	NRSA63J-473N	RESISTOR
	R76	NRSA63J-0R0A	RESISTOR
	R77	NRSA63J-0R0A	RESISTOR
	R79	NRSA63J-0R0A	RESISTOR
	R80	QRD161J-104	RESISTOR
⚠	R81	PU52108-100	POSITIVE THERMISTOR
	C1	NEH11CM-106NZ	E CAPACITOR
	C2	NCF31CZ-104A	CAPACITOR
	C3	NEH10JM-107NP	E CAPACITOR
	C4	NCF31CZ-104A	CAPACITOR
	C5	NCF31CZ-104A	CAPACITOR
	C6	NCF31CZ-104A	CAPACITOR
	C7	PU59913-473K	CAPACITOR
	C8	NCF31CZ-104A	CAPACITOR
	C9	NCF31CZ-104A	CAPACITOR
	C10	NCF31CZ-104A	CAPACITOR
	C11	NEH10JM-226NZ	E CAPACITOR
	C12	NCF31CZ-104A	CAPACITOR
	C13	NCT07CH-121A	CAPACITOR
	C14	NCT07CH-330A	CAPACITOR
	C15	PU59758-105	CAPACITOR
	C16	NCT07CH-330A	CAPACITOR
	C17	NCB31CK-223A	CAPACITOR
	C18	QEF80GM-685	E CAPACITOR
	C19	NCR31CK-223A	CAPACITOR
	C20	QEF80GM-685	TANTAL CAPACITOR
	C21	QEF80GM-685	E CAPACITOR
	C22	NCR31CK-223A	CAPACITOR
	C23	QEF80GM-685	E CAPACITOR
	C24	QEF80GM-685	E CAPACITOR
	C25	NCB31CK-223A	CAPACITOR
	C26	QEF80GM-685	TANTAL CAPACITOR
	C27	QEF80GM-685	E CAPACITOR
	C28	PU59913-473K	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	QEF80GM-685	TANTAL CAPACITOR
	C31	QEF80GM-685	E CAPACITOR
	C32	QEF80GM-685	E CAPACITOR
	C33	NCB31EK-103A	CAPACITOR
	C34	NCB31CK-223A	CAPACITOR
	C35	NCB31EK-103A	CAPACITOR
	C36	YU40978	CAPACITOR, 0.1
	C37	NCS31HJ-331A	CAPACITOR
	C38	YU40978	CAPACITOR, 0.1

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION
	C39	NCF31CZ-104A	CAPACITORCF
	C40	NCS31HJ-331A	CAPACITOR
	C41	YU40978	CAPACITOR, 0.1
	C42	NCS31HJ-331A	CAPACITOR
	C43	YU40978	CAPACITOR, 0.1
	C44	NCS31HJ-331A	CAPACITOR
	C45	QEF80GM-685	TANTAL CAPACITOR
	C46	NEH10JM-226NZ	E CAPACITOR
	C47	NCF31CZ-104A	CAPACITOR
	C48	NCT07CH-101A	CAPACITOR
	C49	NCT07CH-220A	CAPACITOR
	C50	NCT07CH-220A	CAPACITOR
	C52	NCB31EK-103A	CAPACITOR
	C53	NCB31EK-103A	CAPACITOR
	C54	NCB31EK-103A	CAPACITOR
	C55	NCB31EK-103A	CAPACITOR
	C56	NCB31EK-103A	CAPACITOR
	C57	NCB31EK-103A	CAPACITOR
	C58	NEH10JM-226NZ	E CAPACITOR
	C59	NCF31CZ-104A	CAPACITOR
	C60	NCF31CZ-104A	CAPACITOR
	C61	NCB31EK-103A	CAPACITOR
	C62	NCB31HK-102A	CAPACITOR
	C63	QCS11HJ-330	CAPACITOR
	C71	PU58948-104	CAPACITOR
	L2	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L3	YU40740-220KY	COIL
	OR	YU40248-220KY	COIL
	L4	PU58201-121K	COIL
	L5	YU40740-470KY	COIL
	OR	YU40248-470KY	COIL
	L6	YU40740-470KY	COIL
	OR	YU40248-470KY	COIL
	L7	PU58201-330K	COIL
	BPF1	YU40700	CHIP FILTER
	OR	YU40703	CHIP FILTER
	BPF2	YU40701	CHIP FILTER
	OR	YU40704	CHIP FILTER
⚠	X1	YU40818	CRYSTAL UNIT
⚠	OR	YU40819	CRYSTAL UNIT
	CN-1	PU58655-4	CAP HOUSING
	CN-2	YU40670-14	BOARD TO BOARD
	CN-3	PU58655-2	CAP HOUSING
	CN-4	PU58655-3	CAP HOUSING
	CN-5	PU58655-4	CAP HOUSING
	CN-6	PU58655-3	CAP HOUSING
	CN-7	PU58655-3	CAP HOUSING

# ⚠	REF. NO.	PART NO.	PART NAME, DESCRIPTION

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CTL BOARD ASSEMBLY <24>

REF. NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	YB20094A-C	CTL BOARD ASSY
SW1	YU40708	TACT SWITCH
SW2	YU40708	TACT SWITCH
SW3	YU40708	TACT SWITCH

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UPPER DRUM BOARD ASSEMBLY <30>

REF. NO.	PART NO.	PART NAME, DESCRIPTION
PWBA	YDM3021-2	UPPER DRUM BOARD

E. & O. E. No. 86038

SECTION 8
TECHNICAL INFORMATIONS

8.1 Mechacon IC 401 Pin function (IC401)

Pin No.	Symbol	Label	IN/OUT	NOTE
1	AN7	END SENSOR	IN	TAPE END DETECT
2	AN6	BATTERY	IN	BATTERY VOLTAGE DET (9.2V: ALARM, 8.8V: POWER OFF)
3	AN5	MECHA-B	IN	CONTROL PANEL COVER, DEW SENSOR, AC ADAPTER
4	AN4	MECHA-A	IN	MODE SW B, MODE SW A, CASSETTE HOUSING LOCK SW
5	AN3	TEST	IN	TEST0, TEST1, NTSC/PAL
6	AN2	KEY SW-A	IN	TRIG, PLAY, STOP, PAUSE/STILL, FF, REW, SP/EP
7	P41	LOAD M FWD (H)	OUT	
8	P40	LOAD M REV (H)	OUT	
9	P37	LOADING V UP	OUT	NORM(H): 6V, UP(L): 8V
10	SCLK	SERIAL CLOCK	IN	E. VF INDICATOR DATA
11	S0	SERIAL DATA	OUT	
12	P34	END LED ON (L)	OUT	PULSE DRIVE
13	P33	CAPSTAN FG	IN	TAPE REMAIN, SP/EP DETECT
14	$\overline{\text{INT2}}$	SW INTERRUPT	IN	POWER, EJECT, REC SAFETY SW ON (L)
15	P31	NC		
16	P30	POWER LED CTL	OUT	ON(L)/OFF(H)
17	$\overline{\text{INT1}}$	DRUM FF	IN	DRUM ROTATE DET, REC START TIMING, END LED ON TIMING
18	CNVss	GND	IN	
19	$\overline{\text{RESET}}$	RESET(L)	IN	
20	Xin	CLOCK 4 MHz	IN	
21	Xout		OUT	
22	φ	NC		
23	Vss	GND	IN	
24	P57	PB CTL PULSE	IN	EDITING TIMING, SP/EP DET
25	P56	SW-D	IN	EDITING TIMING
26	P55	TAKE-UP REEL FG	IN	REEL ROTATE DET
27	P54	SUPPLY REEL FG	IN	REEL ROTATE DET, TAPE REMAIN DET
28	P53	READY (H)	OUT	E. VF INDICATOR DATA OUTPUT READY
29	P52	POWER SW ON (L)	IN	
30	P51	EJECT SW ON (L)	IN	
31	P50	REC SAFETY SW	IN	ON(L)/OFF(H)
32	P17	V. REC MUTE (L)	OUT	
33	P16	EP(H)/SP(L)	OUT	
34	P15	VIDEO REC (L)	OUT	
35	P14	CTL ERASE HEAD	OUT	ON(H)/OFF(L)
36	P13	PB(L)	OUT	
37	P12	AUDIO REC BIAS	OUT	ON(L)/OFF(H)
38	P11	AUDIO PB(H)	OUT	PB (H), EE or REC (L)
39	P10	AUDIO REC(H)	OUT	REC (H), EE or PB (L)
40	P07	AUDIO MUTE (L)	OUT	SEARCH or STILL (L)
41	P06	TRIGGER	OUT	START(H)/STOP(L)
42	P05	FRYING ERASE	OUT	ON(H)/OFF(L)
43	P04	SEARCH REW (H)	OUT	
44	P03	CAMERA ON (H)	OUT	
45	P02	SEARCH (H)	OUT	
46	P01	DRUM ON (H)	OUT	
47	P00	CAPSTAN CTL	OUT	SERVO(L)/MECHACON(H)
48	P27	CAPSTAN REV (L)	OUT	
49	P26	CAPSTAN FWD (L)	OUT	
50	P25	REC CTL DUTY	OUT	65%(H), 55%(L)
51	P24	NC		
52	P23	MODE-I	OUT	
53	P22	MODE-A	OUT	
54	P21	PAUSE(H)	OUT	REC PAUSE or STILL (H)
55	P20	V. PULSE ON (H)	OUT	SEARCH or STILL (H)
56	Vcc	UNSW 5V	IN	
57	AVss	GND	IN	FOR ANALOG PORT
58	Vref	SW 5V	IN	FOR ANALOG PORT
59	D-A	CAPSTAN REF	OUT	FF/REW CONTROL VOLTAGE OUTPUT
60	PWM	NC	OUT	

Table 8-1 IC401 pin function

NOTE

SECTION 8
TECHNICAL INFORMATIONS

8.1 Mechacon IC 401 Pin function (IC401)

Pin No.	Symbol	Label	IN/OUT	NOTE
1	AN7	END SENSOR	IN	TAPE END DETECT
2	AN6	BATTERY	IN	BATTERY VOLTAGE DET (9.2V: ALARM, 8.8V: POWER OFF)
3	AN5	MECHA-B	IN	CONTROL PANEL COVER, DEW SENSOR, AC ADAPTER
4	AN4	MECHA-A	IN	MODE SW B, MODE SW A, CASSETTE HOUSING LOCK SW
5	AN3	TEST	IN	TEST0, TEST1, NTSC/PAL
6	AN2	KEY SW-A	IN	TRIG, PLAY, STOP, PAUSE/STILL, FF, REW, SP/EP
7	P41	LOAD M FWD (H)	OUT	
8	P40	LOAD M REV (H)	OUT	
9	P37	LOADING V UP	OUT	NORM(H): 6V, UP(L): 8V
10	SCLK	SERIAL CLOCK	IN	E. VF INDICATOR DATA
11	S0	SERIAL DATA	OUT	
12	P34	END LED ON (L)	OUT	PULSE DRIVE
13	P33	CAPSTAN FG	IN	TAPE REMAIN, SP/EP DETECT
14	$\overline{\text{INT2}}$	SW INTERRUPT	IN	POWER, EJECT, REC SAFETY SW ON (L)
15	P31	NC		
16	P30	POWER LED CTL	OUT	ON(L)/OFF(H)
17	$\overline{\text{INT1}}$	DRUM FF	IN	DRUM ROTATE DET, REC START TIMING, END LED ON TIMING
18	CNVss	GND	IN	
19	$\overline{\text{RESET}}$	RESET(L)	IN	
20	Xin	CLOCK 4 MHz	IN	
21	Xout		OUT	
22	ϕ	NC		
23	Vss	GND	IN	
24	P57	PB CTL PULSE	IN	EDITING TIMING, SP/EP DET
25	P56	SW-D	IN	EDITING TIMING
26	P55	TAKE-UP REEL FG	IN	REEL ROTATE DET
27	P54	SUPPLY REEL FG	IN	REEL ROTATE DET, TAPE REMAIN DET
28	P53	READY (H)	OUT	E. VF INDICATOR DATA OUTPUT READY
29	P52	POWER SW ON (L)	IN	
30	P51	EJECT SW ON (L)	IN	
31	P50	REC SAFETY SW	IN	ON(L)/OFF(H)
32	P17	V. REC MUTE (L)	OUT	
33	P16	EP(H)/SP(L)	OUT	
34	P15	VIDEO REC (L)	OUT	
35	P14	CTL ERASE HEAD	OUT	ON(H)/OFF(L)
36	P13	PB(L)	OUT	
37	P12	AUDIO REC BIAS	OUT	ON(L)/OFF(H)
38	P11	AUDIO PB(H)	OUT	PB (H), EE or REC (L)
39	P10	AUDIO REC(H)	OUT	REC (H), EE or PB (L)
40	P07	AUDIO MUTE (L)	OUT	SEARCH or STILL (L)
41	P06	TRIGGER	OUT	START(H)/STOP(L)
42	P05	FRYING ERASE	OUT	ON(H)/OFF(L)
43	P04	SEARCH REW (H)	OUT	
44	P03	CAMERA ON (H)	OUT	
45	P02	SEARCH (H)	OUT	
46	P01	DRUM ON (H)	OUT	
47	P00	CAPSTAN CTL	OUT	SERVO(L)/MECHACON(H)
48	P27	CAPSTAN REV (L)	OUT	
49	P26	CAPSTAN FWD (L)	OUT	
50	P25	REC CTL DUTY	OUT	65%(H), 55%(L)
51	P24	NC		
52	P23	MODE-I	OUT	
53	P22	MODE-A	OUT	
54	P21	PAUSE(H)	OUT	REC PAUSE or STILL (H)
55	P20	V. PULSE ON (H)	OUT	SEARCH or STILL (H)
56	Vcc	UNSW 5V	IN	
57	AVss	GND	IN	FOR ANALOG PORT
58	Vref	SW 5V	IN	FOR ANALOG PORT
59	D-A	CAPSTAN REF	OUT	FF/REW CONTROL VOLTAGE OUTPUT
60	PWM	NC	OUT	

Table 8-1 IC401 pin function

NOTE

8.2 Digital servo LSI (IC101)

All the terminal functions of IC101 are listed here for reference in servicing.

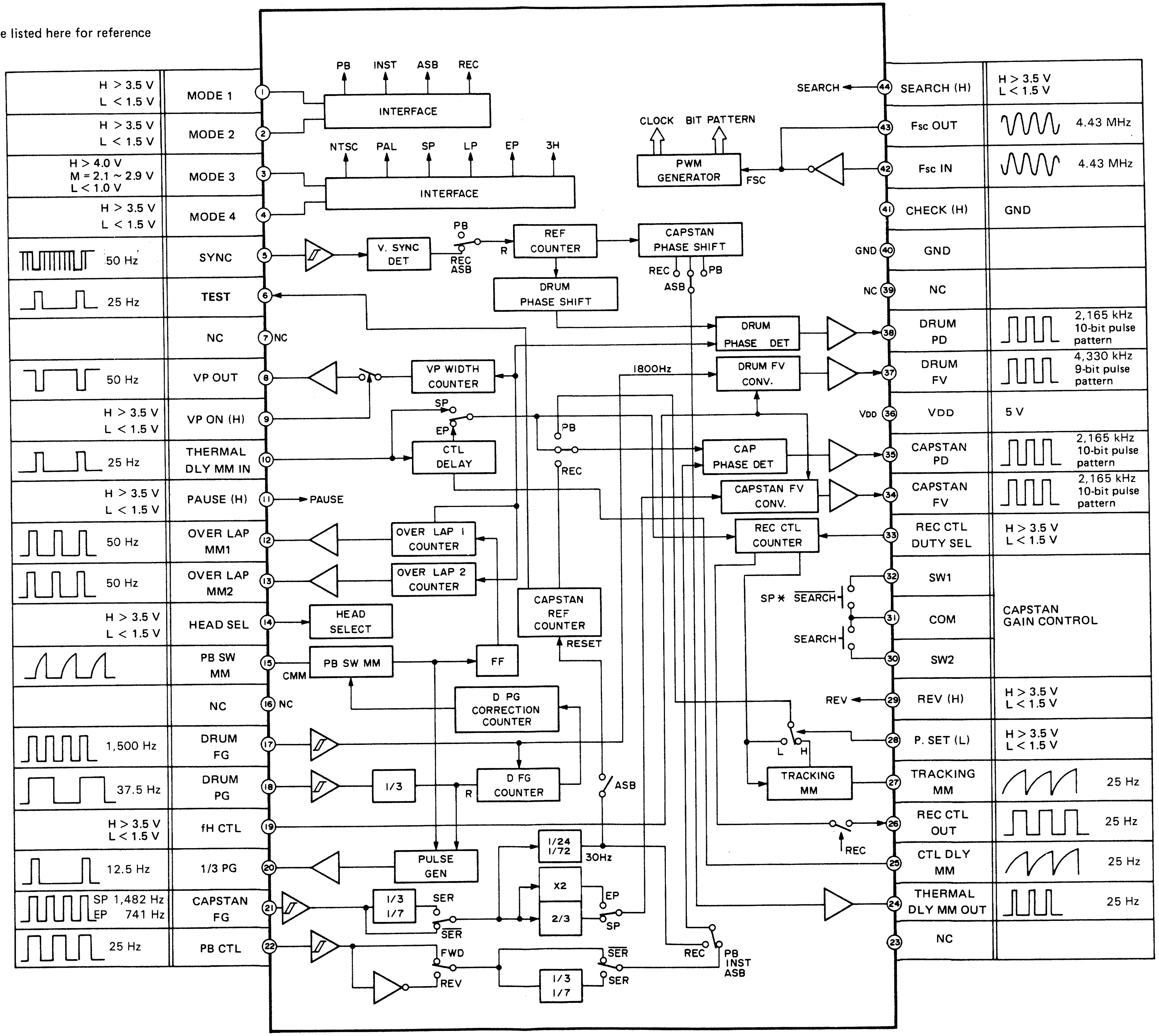
MODE				Pin No.
REC	ASB	INST	PB	
H	H	L	L	1
H	L	H	L	2

MODE						Pin No.
PAL		NTSC				
3H		9H		3H		
LP	SP	EP	SP	EP	SP	
H	H	M	M	L	L	3
H	L	H	L	H	L	4

MODE		Pin No.
VP		
ON	H	9
OFF	L	

MODE		Pin No.
PAUSE		
ON	H	11
OFF	L	

MODE		Pin No.
HEAD SEL		
4 HEAD	H	14
DA 8	L	


H > 3.5 V L < 1.5 V
MODE 1
H > 3.5 V L < 1.5 V
MODE 2
H > 4.0 V M = 2.1 ~ 2.9 V L < 1.0 V
MODE 3
H > 3.5 V L < 1.5 V
MODE 4
50 Hz
SYNC
25 Hz
TEST
NC
50 Hz
VP OUT
H > 3.5 V L < 1.5 V
VP ON (H)
25 Hz
THERMAL DLY MM IN
H > 3.5 V L < 1.5 V
PAUSE (H)
50 Hz
OVER LAP MM1
50 Hz
OVER LAP MM2
H > 3.5 V L < 1.5 V
HEAD SEL
PB SW MM
NC
1,500 Hz
DRUM FG
37.5 Hz
DRUM PG
H > 3.5 V L < 1.5 V
fH CTL
12.5 Hz
1/3 PG
SP 1,482 Hz
EP 741 Hz
CAPSTAN FG
25 Hz
PB CTL
PB
INST
ASB
REC
INTERFACE
NTSC
PAL
SP
LP
EP
3H
INTERFACE
V. SYNC DET
PB
REC ASB
R
REF COUNTER
CAPSTAN PHASE SHIFT
REC
ASB
PB
DRUM PHASE SHIFT
NC
VP WIDTH COUNTER
SP
EP
CTL DELAY
PAUSE
OVER LAP 1 COUNTER
OVER LAP 2 COUNTER
HEAD SELECT
CAPSTAN REF COUNTER
RESET
PB SW MM
CMM
FF
NC
D PG CORRECTION COUNTER
1/3
D FG COUNTER
R
ASB
PULSE GEN
1/24
1/72
30Hz
X2
EP
1/3
1/7
SER
SER
2/3
SP
FWD
REV
SER
SER
1/3
1/7
REC
PB
INST
ASB
CLOCK
BIT PATTERN
PWM GENERATOR
FSC
SEARCH
1800Hz
DRUM PHASE DET
DRUM FV CONV.
PB
REC
CAP PHASE DET
CAPSTAN FV CONV.
REC CTL COUNTER
SP ✱
SEARCH
SEARCH
REV
L
H
TRACKING MM
REC
GND
NC
VDD
SEARCH (H)
H > 3.5 V L < 1.5 V
Fsc OUT
4.43 MHz
Fsc IN
4.43 MHz
CHECK (H)
GND
GND
NC
DRUM PD
2,165 kHz 10-bit pulse pattern
DRUM FV
4,330 kHz 9-bit pulse pattern
VDD
5 V
CAPSTAN PD
2,165 kHz 10-bit pulse pattern
CAPSTAN FV
2,165 kHz 10-bit pulse pattern
REC CTL DUTY SEL
H > 3.5 V L < 1.5 V
SW1
COM
SW2
CAPSTAN GAIN CONTROL
REV (H)
H > 3.5 V L < 1.5 V
P. SET (L)
H > 3.5 V L < 1.5 V
TRACKING MM
25 Hz
REC CTL OUT
25 Hz
CTL DLY MM
25 Hz
THERMAL DLY MM OUT
25 Hz
NC

Pin No.	MODE	
	SEARCH	
44	H	SEARCH
	L	NORM

Pin No.	MODE	
	REC CTL DUTY	
33	H	65%
	L	55%

Pin No.	MODE	
	REV	
29	H	REV
	L	NORM

Pin No.	MODE	
	P. SET	
28	H	OFF
	L	ON

Fig. 8-2 Block diagram of IC101 with terminal functions

SECTION 9
SERVICE GUIDE

9.1 Emergency mode

No.	Display (Flash)	Contents	Observing mode	Shifted mode
0	E05	P.B. CTL pulse input absent	During Zero Frame Editing	STOP
1	E04	Drum flipflop input absent	Drum rotation, Zero Frame Editing	STOP
2	E03	Reel sensor input absent	PB, REC, SFF	STOP
3	E02	Loading motor rotates for more than 10 sec without shift to next mode	Unloading	Maintenance
4	E01	Loading motor rotates for more than 10 sec without shift to next mode	Loading	Maintenance

Emergency mode: Indication for 5 minutes, then power OFF (power not turned OFF when using AC adapter)
Port states : Same as Stop mode
Effective key : POWER
Shifted mode : Power OFF

Table 9-1 Emergency mode table